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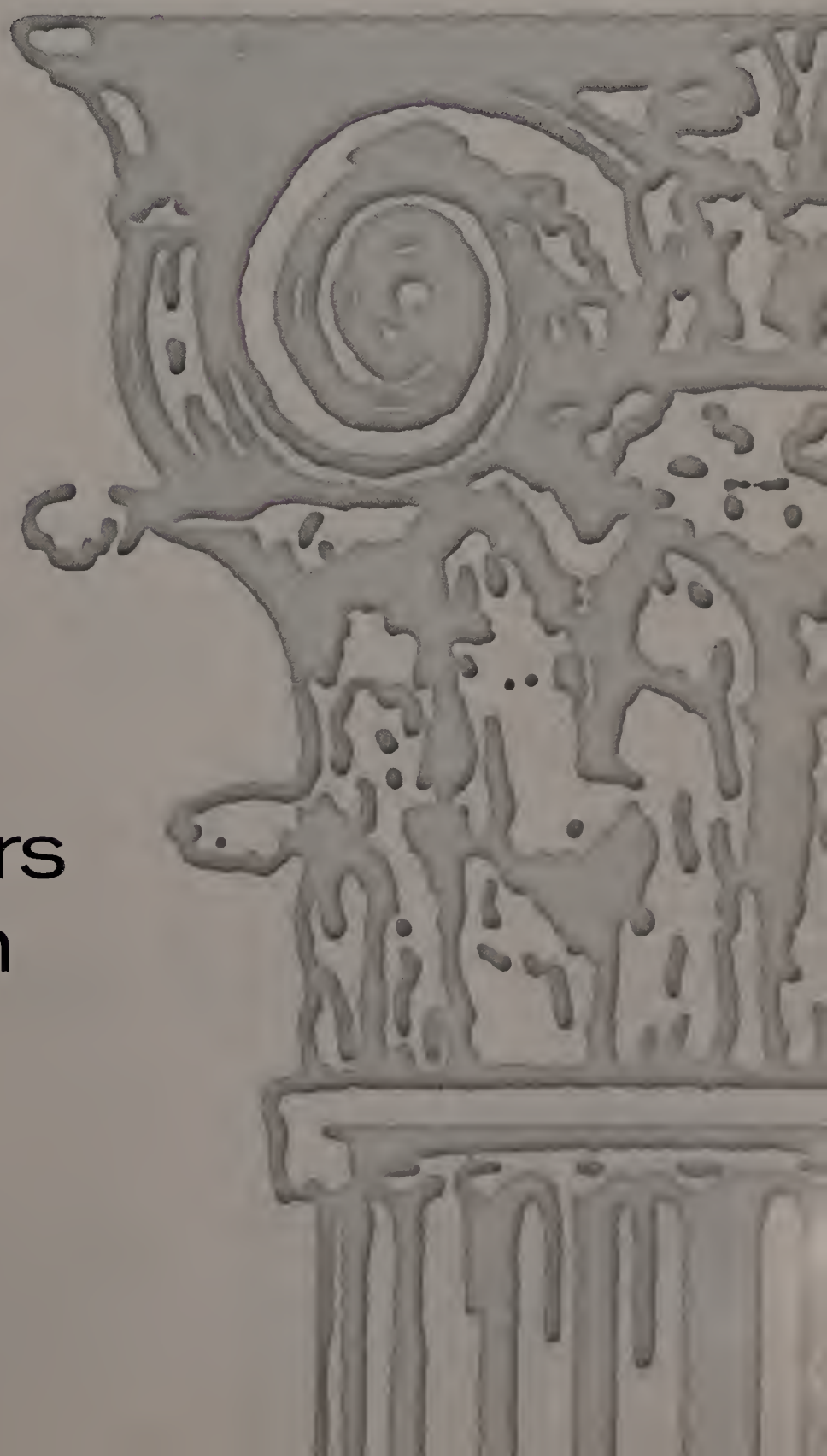
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MAY 10, 1999 • VOL. 33 • NO. 19 • \$4 COPY

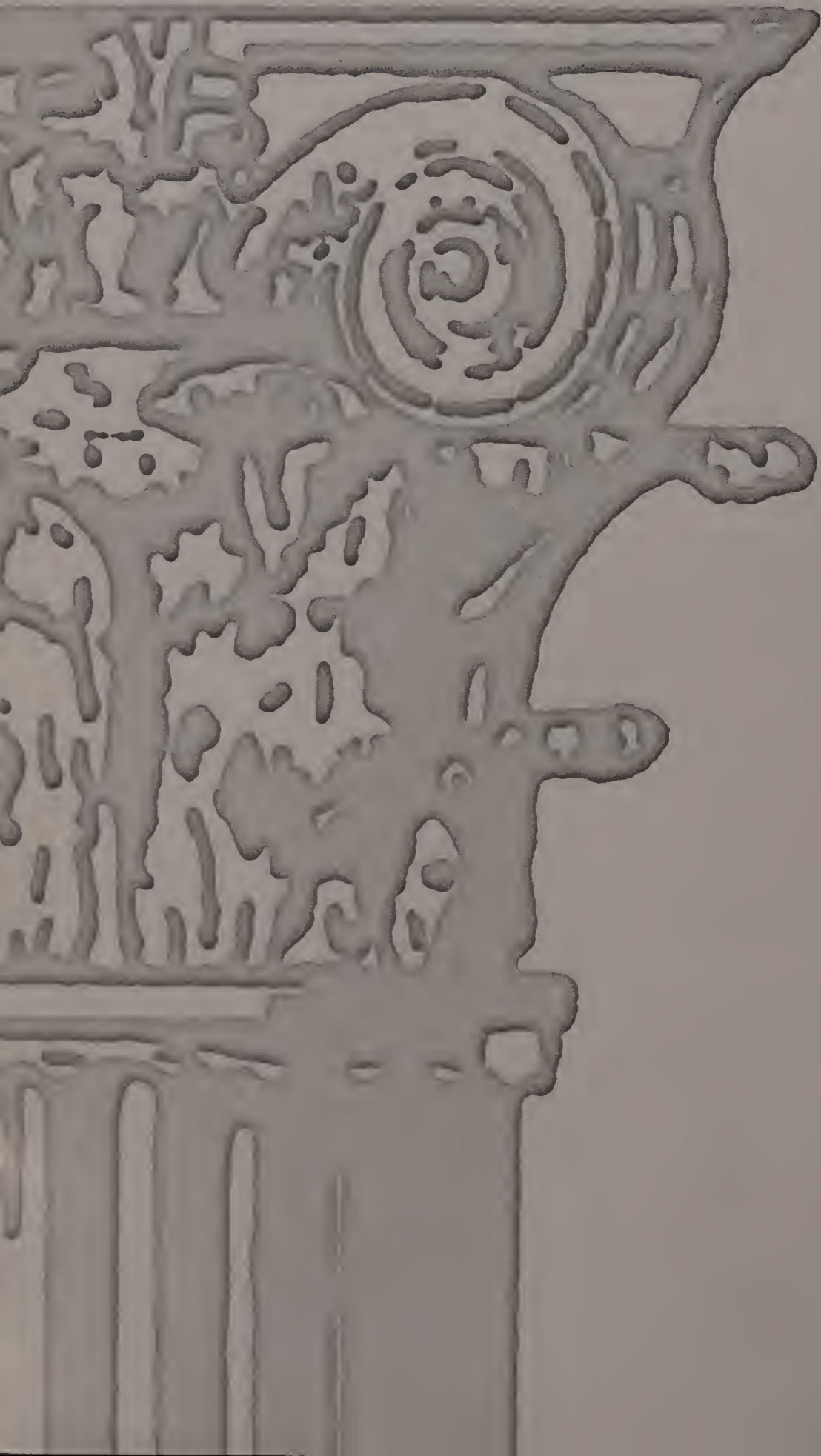
REVOLUTIONS NEED LEADERS

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AWARDS

Honoring the Leaders
of the IT Revolution



DOCUMENTING A REVOLUTION IN PROGRESS



The technology revolution is best defined by the achievements of the men and women who are leading it.

TECHNOLOGY AFFECTS nearly every aspect of our daily lives, from our jobs to our recreation. But for all the chips and circuitry, the technology revolution is best defined by the achievements of the men and women who are leading it.

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As the Newspaper for IT Leaders, *Computerworld* is at the heart of the IT Community, honoring the IT Leaders of the past, guiding the IT Leaders of the present, and developing the IT Leaders of the future.

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JACK BUFFINGTON, director of e-commerce at an insurance company, will rely on the Internet to run the very core of his business: a new extranet serving 12,000 independent agents



future.com

IT'S BEEN 25 YEARS since the Internet protocols were published, and now the Net is transforming the world of commerce, with traffic more than doubling each year. The question for the next 25 years is whether the Internet's infrastructure can handle all that success, reports Gary H. Anthes. Even the new breed of network router is just barely keeping up with the demand for bandwidth-hungry applications, such as heavy-duty extranets, Internet telephony, full-length videos and online catalogs packed with high-resolution graphics. *Report begins on page 80.*

How to Avoid a Rip-Off:

- Reject orders that are missing information
- Be wary of orders with different "bill to" and "ship to" addresses
- Watch out for orders that come from free e-mail services
- Be wary of unusually large orders that request next-day delivery

SOURCE: WWW.SCAMBUSTERS.ORG, A WEB SITE RUN BY NETRAGEOUS INC., AN INTERNET MARKETING FIRM IN OLNEY, MO

FEDS MAKE BUST IN \$45M NET SCAM

Credit-card fraud plagues e-commerce

BY KIM S. NASH
AND ANN HARRISON

In what may be the biggest Internet credit-card billing scam to date, federal agents last week arrested a Malibu, Calif., man who allegedly engineered \$45 million in bogus charges on hundreds of thousands of transactions.

Credit-card fraud is a big

problem for online merchants [CW, March 8]. An official at Visa International Inc., for example, recently said half of Visa's transactions from online sales are disputed or full-fledged frauds.

Kenneth H. Taves and four
Net Scam, page 16

H-1B VISA ABUSE ON RISE, HOUSE TOLD

Critics charge vague policies leave door open

BY BARB COLE-GOMOLSKI

Officials from the U.S. Immigration and Naturalization Service and other agencies last week called for tighter controls over issuing H-1B visas after testifying before a House subcommittee meeting about

SAP RUSHES TO REPAIR APPAREL APP

Demand overwhelmed developers; CEO vows to 'clean up the mess pronto'

BY CRAIG STEDMAN
NICE, FRANCE

SAP AG is rushing to fix problems with its R/3-based apparel and footwear applications that drove at least one U.S. buyer to stop installing the software.

"It's a mess, and we need to clean it up pronto," said SAP CEO Hasso Plattner last week. "We'll throw everything we have to at it."

At Sapphire '99, the company's European user conference held here, Plattner confirmed that New York-based clothing maker The Warnaco Group Inc. pulled the plug — at least for now — on its plan to use the Apparel and Footwear Solution add-on to SAP's R/3 enterprise resource planning suite.

Officials at Warnaco, a \$2 billion company that makes Calvin Klein jeans, underwear and other items, couldn't be reached for comment.

To try to stabilize AFS, SAP last month folded the small development team that was writing the software into its retail and consumer goods business unit. More developers were as-

signed to the product, and SAP also set up a SWAT team to work with users on customizations and performance tuning.

AFS, a key part of SAP's effort to expand beyond its traditional manufacturing strongholds, was released last spring and quickly bought by about

60 apparel and footwear makers looking for packaged software that could meet their specialized needs.

SAP, page 105

E-BANKING TRIPS OVER OLD GUARD

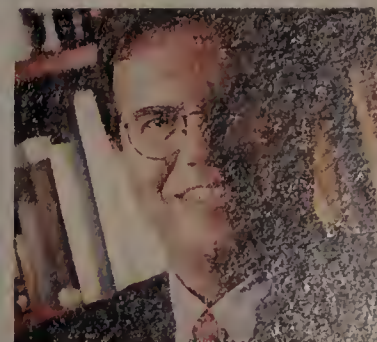
CIOs: Companies must fight Net rivals head-on

BY THOMAS HOFFMAN

Financial services executives agree they must embrace e-commerce — even to the point of selling their competitors' products online — if they're to survive in the long run.

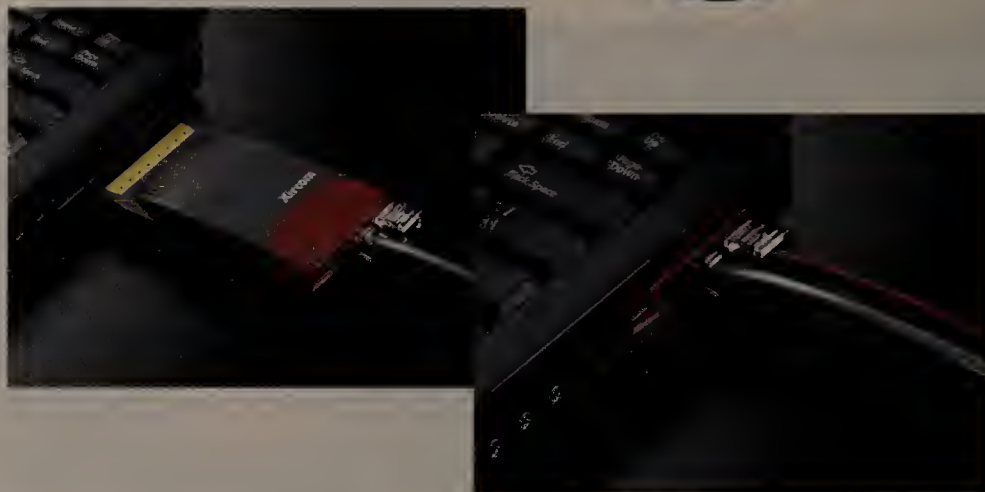
"What cable and satellite have done to network television, the Internet is about to do to financial services," said Edward Horowitz, e-commerce czar at Citigroup Inc. in New

E-Banking, page 16



CITIGROUP'S EDWARD HOROWITZ

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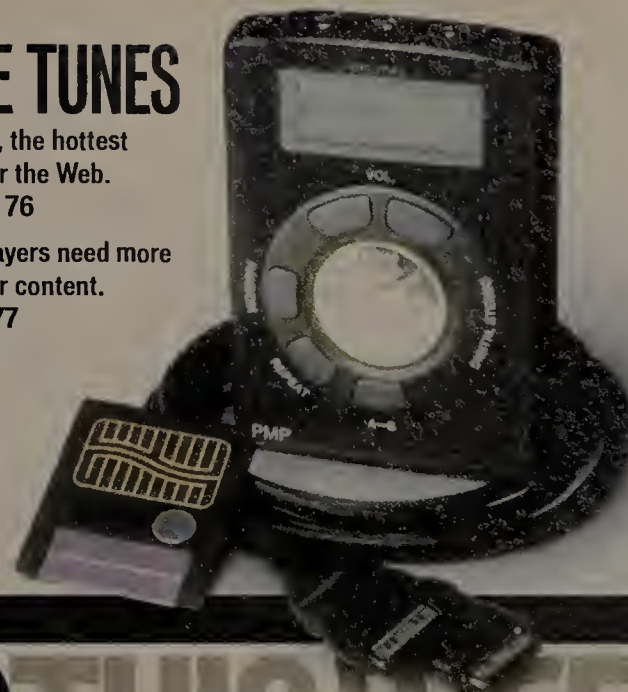
SURFIN' FOR WORK

Here's how and where to make the most of your Internet job searches to find that plum position. Page 56

TOTABLE TUNES

Learn about MP3, the hottest audio standard for the Web. QuickStudy, page 76

Fledgling MP3 players need more storage and better content. Exec Tech, page 77



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MAY 10, 1999

NEWS

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- 8 CUSTOMERS WANT** the feds to give PC makers more freedom to bundle non-Microsoft software as part of any antitrust settlement, according to a *Computerworld* poll.
- 10 FLEET CTO** Michael Zucchini will retire, leaving most of the Fleet/BankBoston merger to former Sears CIO Joe Smialowski.
- 20 WESTERN UNION** Financial Services outsources its PC support to Unisys.
- 24 CYBERSQUATTERS** who register domain names in hopes of selling them for a huge profit come under fire.
- 29 ESTHER DYSON SAYS** overinflated Web stocks will crash when people start seeing Y2K bugs and turn sour on the tech sector.
- 20 IBM ANNOUNCES** a beta version of a tool set to help developers build Java apps for devices such as cellular phones.

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- 67 MORTGAGE GIANT** Freddie Mac eases the PC workload by centralizing reports on a server.
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- 74 START-UP BIZRATE** offers free reports on what customers think of your Web site.
- 80 WE LOOK AT** upcoming Internet technologies that will matter most to IT.
- 84 FLASHBACK:** In 1967, Doug Engelbart applied for a patent on the mouse.
- 87 CAN YOU FIND** an IT job in the San Francisco Bay area? Do you have a pulse?

WHAT CABLE AND SATELLITE HAVE DONE TO NETWORK TELEVISION, THE INTERNET IS ABOUT TO DO TO FINANCIAL SERVICES.

EDWARD HOROWITZ,
SENIOR CORPORATE EXECUTIVE,
CITIGROUP, ON THE DANGER THAT FINANCIAL INSTITUTIONS FACE FROM WEB-BASED COMPETITORS.
SEE PAGE 1.

AT DEADLINE

PDA Database Debuts

PointBase Inc. in San Mateo, Calif., plans to announce today an embedded, Java-based database for e-commerce servers and applications, including Web-based personal digital assistants. Competitors include Sybase Inc., Oracle Corp. and Cloudscape Inc. in Oakland, Calif. Recently, Bluestone Software Inc. in Mount Laurel, N.J., announced a free Extensible Markup Language synchronization application for Palm Computing Inc. handhelds.

Vendors Sponsor Y2K Site for the Masses

The PC Y2K Alliance will post year 2000 compliance specifications for consumers and smaller businesses on the Web starting today at www.pcy2000.org. The 12-company alliance includes many major PC makers. Analysts praised the site's emphasis on describing the year 2000 problem in laymen's terms.

Y2K Issues Slow Data Warehouse Plans

Year 2000 issues are hampering just over half of the data warehousing development projects now under way, according to a survey by Cutter Information Corp. in Arlington, Mass. The consulting firm said 51% of the 96 companies it surveyed reported that their warehousing projects were being affected, although the biggest block - 35% of those who took part - said the impact had been only slight.

Short Takes

PEOPLESOFT INC. plans to ship an upgrade of its enterprise resource planning applications by midyear. . . . **COMPAQ COMPUTER CORP.** has extended its Non-Stop Himalaya line of fault-tolerant servers with a system that boosts performance by 20% and improves memory management. . . . Units of **LOCKHEED MARTIN CORP.** and **TRW INC.** are among the backers of a \$3.6 billion venture to build a global wireless broadband network called **ASTROLINK LLC**. . . . **IBM** has unveiled the WorkPad z50, a Jupiter-class handheld computer running the Windows CE operating system.

SQL USERS TURN TO ORACLE8 FOR BULK

Scalability key issue for enterprise apps

BY STEWART DECK

THREE SQL Server users with big Internet plans have decided that Microsoft's database and Windows NT platform won't let them grow fast enough, so they're ripping out the software and replacing it with Oracle8. One of the users, RIT Systems Inc. in Edina, Minn., said doing so could

mean a possible tenfold increase in its database costs, but it would be worth it to assure the system's scalability and faster transaction processing.

Insurance Holdings of America Inc., a Beverly, Mass.-based distributor of insurance products, has an extranet that lets agents link with companies such as Travelers Insurance Co. to get quotes and even sell policies. The system was built

originally on Microsoft's SQL Server 6.5 but will be moved to Oracle Corp.'s Oracle8 database. "Microsoft said we'd need an all-Microsoft application if we wanted full scalability, but who's going to rebuild the whole system?" said Brian McCarthy, CEO of Insurance Holdings. "SQL 7.0 is great for nonenterprise applications, but if you're going to run a heavy transaction-intense platform you've gotta go with IBM DB2 or Oracle."

Digital Impact in San Mateo, Calif., also recently decided to make the switch. The e-mail marketer, whose clients include The Gap and Tower Records, sends out about 25 million e-mails per month and tracks the responses. "We kept buying bigger hardware, but there were plenty of times the SQL Server database server would crash with too many hits at the same time," said Ray Kaupp, a marketing vice president at Digital Impact (www.digital-impact.com). "We looked at 7.0 but still were concerned about making SQL Server scale up to handle our transaction volume, which was doubling every couple months."

Another Web-based enterprise, Techies.com (www.techies.com), is an online headhunting service run by RIT Systems that matches information technology professionals with companies looking for skilled workers. It had migrated its

database to SQL Server 7.0 but later decided its future needs would outstrip the Microsoft database. It, too, is moving to Oracle8.

"When you look at the capability of SQL Server 7.0 on a four-processor box [its NT limit] and compare it to Oracle on a 54-processor box, there is no comparison," said Stuart Burden, chief technology officer at RIT.

Merv Adrian, an analyst at Giga Information Group Inc. in Cambridge, Mass., agreed that users will start to push the limits of SQL Server 7.0 when they have hundreds of gigabytes of data or hundreds of users. But many clients are enticed by SQL Server 7.0's attractive price tag, said Mike Shroeck, an analyst at PricewaterhouseCoopers in Chicago.

Barry Goffe, a Microsoft product manager, pointed out that SQL Server 7.0 sales have seen 50% growth quarter-to-quarter this year. "There are still some solutions out there that require more scalability than our platform [currently] has to offer," he said. ▀

Novell Releases NDS 8.0

Directory raises the bar on scalability

BY SHARON GAUDIN

Novell Inc. is raising the directory bar this week with the release of Novell Directory Services (NDS) 8.0, which has leapt from handling hundreds of thousands of objects to a billion [CW, March 8 and 15].

Although early users are pleased, one analyst said NDS 8's capabilities far exceed today's enterprise demands.

"There isn't one Fortune 100 company that could populate a billion objects," said Todd Chipman, an analyst at Boston-based Giga Information Group Inc. "The world's largest ex-

tranets haven't topped 500,000 objects."

With NDS 8.0, information technology managers should be able to manage and inventory everything on the enterprise, from applications to user profiles. Directory-based applications from other vendors will be required to link to many of those elements.

Available as a free download to NetWare 5 users at www.novell.com, the NetWare 5 version of NDS 8.0 should ship this week; Unix and Windows NT versions are expected this summer. Novell said it's considering an NDS for Linux.

NDS 8.0 is expected to be bundled with the next version of NetWare, due by year's end. ▀

Clarification

A spokesman for Electronic Data Systems Corp. last week said the Plano, Texas-based systems integrator will not be spending "millions of dollars" migrating 100,000-plus desktops from Windows 95 to 98, as *Computerworld* reported in an April 19 News story ("Win 95 Y2K Fix Was Kept From Users," page 16). That original figure was based on consultants' estimates. EDS, which had declined to provide cost figures for the migration project, now says it will spend \$150,000 on the conversion, or \$1.50 per desktop.

Patent Dispute Chills Web Privacy Initiative

BY ANN HARRISON

A patent dispute between an Internet standards group and Seattle developer Intermin Corp. puts large e-commerce vendors at risk of having to pay licensing fees to exchange privacy data with consumers.

The World Wide Web Consortium (W3C) last week said it is investigating a patent claim it said threatens free and open access to Platform for Privacy Preferences (P3P) technology.

The W3C developed P3P to keep users informed of sites' privacy practices, to control

what information is disclosed and to determine how that information may be used. Intermin's president, Brian McManus, said his company's application predates P3P and is based on the same core technologies. If shown to be true, that would give Intermin ownership over P3P.

Ironically, Intermin is a member of the P3P standards group, which has been developing the framework for years. Intermin said it joined the group after notifying the W3C of pending patent applications

filed in February 1996.

W3C introduced P3P in October 1997 and first publicized the technology in March 1998.

McManus said Intermin will offer free licenses for the non-commercial use of P3P and for commercial use by firms with revenue of less than \$2.5 million per year. Larger commercial ventures would pay a 1% royalty on revenue from P3P.

The W3C has called on the Web community to help locate existing technology that could invalidate Intermin's patent claim. ▀

Slice o' Databases

Worldwide market share for database management software vendors

VENDOR	1997	1998
Oracle	37.9%	40.4%
IBM	15.3%	17.8%
Informix	5.8%	5.7%
Microsoft	4.4%	5.1%
Sybase	5.3%	4.4%
Others	31.3%	26.6%

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.



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ENTERPRISE WARNINGS DON'T FAZE NT USERS

*Analysts concerned about scalability,
reliability in high-end applications*

BY DAVID ORENSTEIN
INDIAN WELLS, CALIF.

USERS ARE shrugging off new warnings that Windows NT is neither scalable nor reliable enough for the highest-end enterprise applications. Those interviewed last week said they are happy to embrace NT and the forthcoming Windows 2000 for major, if not the most critical, applications.

At a conference here last week, Gartner Group Inc. analysts said that although NT is improving, the most demanding applications — those that serve thousands of users and require around-the-clock operation and high fault tolerance — are better off on Unix systems or on a mainframe.

A report last month by International Data Corp. in Framingham, Mass., raised similar concerns.

"Don't think about scaling with NT clusters for about three years," said Al Hilwa, an analyst at Gartner Group, a Stamford, Conn.-based research firm. Similarly, Microsoft Corp.'s COM+ middleware will take years to mature, said analyst John Enck.

One Slice of the Pie

Gartner analysts acknowledged that their critiques of NT and Windows 2000 are focused on the most mission-critical operations of large companies, where many users aren't now considering NT.

Gartner analyst Joe Barkan conceded that "NT is good enough to satisfy many appli-

cation requirements today, [but] it will not be best-of-breed in any data-center context through 2002."

Even below the mission-critical high end, users with a need for constant and fast processing of huge amounts of data may need to turn to other vendors whose products were designed to shore up NT on the high end, Barkan said.

The Chicago Stock Exchange is migrating its entire trading system to Windows NT 4.0, said John Kerin, vice president of application development. The system processes hundreds of messages per second.

NT 4.0 has proved reliable, Kerin said. The exchange has helped ensure that by using an object database that supplies its own fault-tolerant capabilities on the data tier and by blending in custom code that watches for system failures. The exchange also isn't relying on COM+ or other Microsoft middleware.

**NT more than
meets our
needs. It is
far more
cost-effective
than Unix.**

CAMERON COSGROVE,
IS MANAGER,
PACIFIC MUTUAL
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Instead, it chose to use Object Request Broker and messaging products from Iona Technology Ltd., Kerin said.

NT is poised to play a bigger role at The Hartford Financial Services Group Inc., said Forrest C. Doyle, director of MIS in the Hartford, Conn.-based

company's actuarial division.

Doyle needs to provide about 200 business managers and analysts with financial data in Excel pivot tables and post it to the company's intranet. He is investigating whether Microsoft's SQL Server 7.0 and NT can take over for the existing mainframe. Doyle said he's predisposed to SQL Server because it has been promised to work well with the powerful and familiar Excel.

Reason to Believe

At Pacific Mutual Life Insurance Co. in Newport Beach, Calif., developers have high hopes — based on their satisfaction with NT 4.0 — that Windows 2000 and COM+ will provide a high-performance, low-cost way for its 1,000 end users to access mainframe data from Windows clients, said information systems manager Cameron Cosgrove.

"NT more than meets our needs," he said. "It is far more cost-effective than Unix." ▀

IBM Touts Pumped-Up S/390 as Risk-Free Y2K Option

Upgrade offers extra processors in crunch

BY JAIKUMAR VIJAYAN

Upgrade without fear of Y2K. That's the message surrounding IBM's latest mainframe, the S/390 Generation 6.

The new CMOS system, which IBM said bumps up performance by 50% over Generation 5 models, comes amid widespread expectations of a year 2000-related hardware lockdown later this year [CW, March 29].

Consequently, a major emphasis of the S/390 G6 mainframe is increased performance with no risk attached, said Mike Chuba, an analyst at Gartner Group Inc. in Stamford, Conn. For example, a dynamic upgrade feature supported on the G6 allows companies to buy systems with extra processors that can be turned on only when needed.

That will allow companies

to sock away extra hardware capacity in case it's needed for later this year, said Lyle Gray, CIO at M&I Data Services Inc., a Brown Deer, Wis.-based provider of software and data management services.

No Changes

Most of the G6 microcode — the software layer between the hardware and the operating system — has been brought forward from the G5; users won't have to change anything to run their software on the new hardware. And functional enhancements, like more sophisticated partitioning capabilities, will be extended back to the G5.

The S/390 G6, which is based on 637-MHz CMOS chips, delivers more than 1,600 MIPS capacity (see chart). It is the first IBM server to be powered by the copper interconnect chip technology that supports cooler, faster and smaller mainframes.

As a result of such upgrades, a performance gap between Unix and mainframe systems remains. That's a major reason why Hewitt Associates Inc. expects to buy five G6 systems by year's end, said Dan Kaberon, parallel sysplex manager at the Lincolnshire, Ill.-based benefits outsourcer.

The extra capacity is needed to handle a rapidly growing business providing benefits information reports on 401(k) plans for 150 client companies, Kaberon said.

It's a healthy time for mainframes overall. Meta Group Inc. in Stamford estimates that more than 1 million mainframe MIPS were installed last year, and it projects that demand will grow at more than 33% annually for the next five years.

Much of that demand has been attributed to falling hardware prices: Cost per MIPS today is less than \$3,000, compared with \$4,500 a year ago. ▀

Generation Gap

Comparing the G5 and G6 versions of the IBM S/390:

	S/390 G5	S/390 G6
Released	August 1998	May 1999
Processors supported	10	12
Uniprocessor MIPS	152	201
Total MIPS	1,069	1,614 (estimated)

Microsoft Buys Chunk of AT&T

Microsoft Corp. last week announced that it will spend \$5 billion of its \$22 billion in cash to buy a piece of AT&T Corp. in a deal that will give Microsoft a massive customer base for its operating systems and applications.

AT&T is building a nationwide broadband network to offer consumers continuous access to cable, Internet and phone services. Under the deal, Microsoft will get access to as many as 10 million of those customers. AT&T already had a contract to use Microsoft's Windows CE in 5 million set-top boxes and other non-PC devices; now it will use the operating system in as many as 5 million more.

AT&T will also use Microsoft's e-mail, interactive TV and other software in high-speed network applications to homes in three U.S. cities next year.

As with most major partnerships, government regulators are expected to study the deal for anticompetitive fallout. The AT&T monopoly was broken up in 1984, and Microsoft is now six months into its own federal antitrust trial. — Kim S. Nash

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BRIEFS

Microsoft Seeks End To Java Injunction

Microsoft Corp. is slated to ask the U.S. District Court in San Jose on June 16 to revoke an injunction in Sun Microsystems Inc.'s Java lawsuit. In November, the court issued a preliminary injunction forcing Microsoft to make its products conform to Sun's Java specifications.

Cabletron May Spin Off Services Units

Cabletron Systems Inc. said it's considering spinning off its network management and professional services business units by year's end to boost revenue. The Rochester, N.H., networking vendor would retain a majority interest in any spin-offs.

Venture Adds Speech To E-Commerce

Barely a month after Intel Corp. said it would take a \$30 million stake in Belgian vendor Lernout & Hauspie Speech Products Inc., the two companies said they're planning a joint venture, controlled by Intel, that will incorporate L&H's speech and language technologies in products for e-commerce and telephony.

Microsoft Unveils Windows Updates

Microsoft has released Service Pack 5 for Windows NT 4.0 workstation and server, which provides security patches and more year 2000 fixes. It's also available at www.microsoft.com. The company also shipped Windows 98 Second Edition to PC makers, with added home networking and Internet capabilities, including online conferencing. Its suggested cost is \$109.

Short Takes

IBM plans to create a design center for transaction-processing services to help customers prototype and test complex e-commerce applications and systems designs. . . . 3COM CORP. has cut \$50 off the price of the Palm III and the Palm-Pilot Professional Edition.

PC MAKERS' CHOICE IS TOP USER CONCERN

Poll on Microsoft antitrust case finds No. 1 remedy is to end exclusionary software pacts

BY PATRICK THIBODEAU
WASHINGTON

If Microsoft Corp. loses its antitrust case, the remedy users would most like to see is one that allows PC makers to put whatever software they want

on their systems, according to an exclusive *Computerworld* poll.

There was less agreement on other remedies that are likely under review by government prosecutors. For in-

stance, although 75% of the 103 information technology managers polled said they favored a remedy that blocked Microsoft contracts that induced PC makers to exclude competing software, users were almost evenly divided on the issue of breaking up Microsoft.

The government isn't discussing possible remedies, but antitrust experts said the range of options is well-known.

Ensuring that PC makers can include any software "makes the most sense to me," said Michael Brown, information systems manager at Valmont Industries Inc. in Valley, Neb., an irrigation systems maker. "That's the sure way of getting [software] into new markets and households."

Microsoft said it has no control on what third-party applications PC makers install, but the government contends Microsoft wields influence by setting prices for its Windows operating system.

The poll showed users opposed, 53% to 43%, to forcing Microsoft to make its Windows

source code freely available. One user said that would go too far and that ensuring access to all application programming interfaces is more important.

But Don Graham, IT manager at Genesis Health Care Systems in Zanesville, Ohio, said having the Windows source code would let him improve operating system reliability — something his 450-bed hospital needs. Rebooting the system when operating system problems occur "just doesn't cut it" in a hospital, Graham said.

Of course, government remedies will be moot if Microsoft wins the antitrust case. Both sides have been preparing to return to court late this month.

The Battle Continues

In an unexpected move, Microsoft said it would re-call David Colburn, an America Online Inc. (AOL) executive who testified on behalf of the government. Colburn is being challenged on his testimony which took place just before the \$4.2 billion merger of AOL and Microsoft rival Netscape Communications Corp. in November.

Microsoft wants to show the merger deal wasn't concluded until after Colburn testified because AOL didn't want to hurt the government's case. ▀

Trial Opinions

STATEMENT	AGREE	DISAGREE	OTHER/ DON'T KNOW
Microsoft has monopolistic power	68%	21%	11%
Microsoft should settle the case	66%	19%	15%
The government has a legitimate case against Microsoft	44%	28%	28%
Microsoft has abused its dominant position in the industry	42%	31%	27%
The government has proven its case against Microsoft	12%	43%	45%

Base: 103 IT managers at companies with 500 or more employees

Bills Aim to Rein in Year 2000 Litigation

Legislation would discourage frivolous suits

BY PATRICK THIBODEAU
AND THOMAS HOFFMAN

Trying to forestall an expected mountain of year 2000 litigation, the U.S. House and Senate may vote as early as this week on two bills that would limit year 2000 liability.

The intent of both bills is to curb frivolous litigation and encourage parties involved in a Y2K glitch to work together to resolve disputes outside court.

The House Judiciary Committee last week approved the House year 2000 liability bill by a 15-14 vote along party lines, but congressional aides said the legislation is ex-

pected to win full House approval. A Senate version ran into some initial difficulty but has since picked up some support.

Any company can be both a defendant and plaintiff in year 2000 litigation. For example, a company could sue a software vendor and be sued by a supply-chain partner for a year 2000 snafu.

If a lawsuit is filed, the bills ensure that defendants will be given the chance to offer proof in court that they took reasonable steps to fix a problem.

That standard may mitigate damages and protect them from summary judgments that might be sought in a negligence suit, legal experts said.

The bills preserve existing contracts between companies.

For instance, if a company has a contract that sets a liability limit, a court can't override it. ▀

Main Points of Y2K Liability

Year 2000 liability-limiting legislation is still a work in progress. The final version will likely include several elements:

- A 30- to 90-day waiting period before litigation can commence.
- Existing contracts will be protected. For example, if a contract between parties sets liability limits, a court won't be able to override those limits.
- Damages will be proportional to actual responsibility.
- Companies can mitigate damages if they can show they did everything they could to prevent a year 2000 glitch.

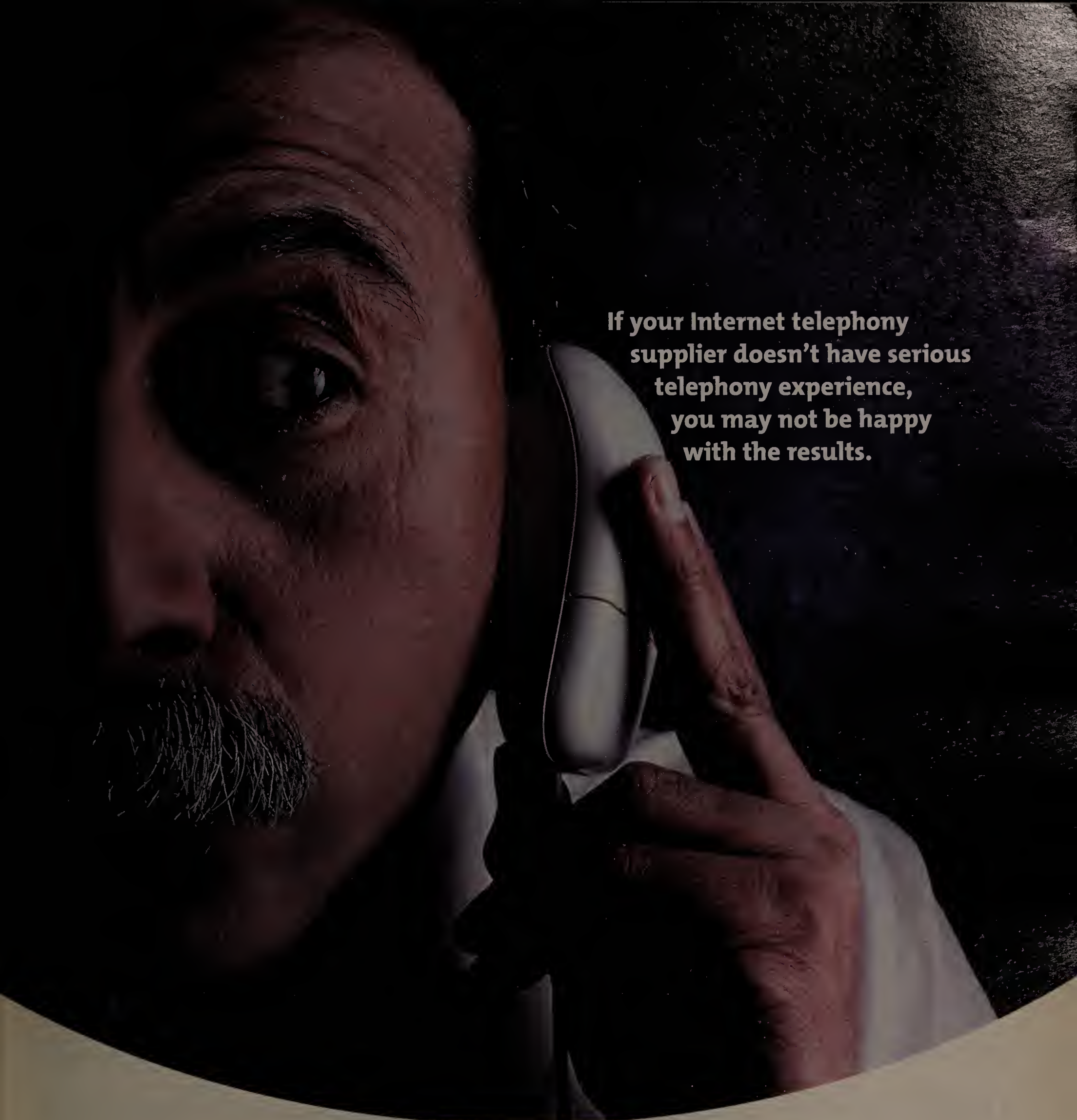
Encryption Ruled Protected Speech

In a decision that could find U.S. encryption export controls unconstitutional, a federal appeals court has ruled encryption programs are protected by the First Amendment and can be posted on the Internet.

A three-judge panel in San Francisco upheld a lower court ruling in favor of University of Chicago math professor Daniel Bernstein, who was banned in 1992 from posting his "Snuffle" encryption algorithm online.

"The ruling would permit U.S. companies to export their [encryption] source code to a specific location overseas where it could then be distributed or compiled into binaries," said John Gilmore, co-founder of the Electronic Frontier Foundation, a sponsor of Bernstein's suit.

The government is reviewing an appeal. — Ann Harrison



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Zucchini Exits Fleet as Bank Tackles Merger

BY BARB COLE-GOMOLSKI

Michael Zucchini, known for his highly effective but ruthless style of merging IT depart-

ments during his tenure at Fleet Financial Group Inc., last week said he will retire as vice chairman and chief technology

officer at the end of the year.

Zucchini, 52, had spoken of early retirement for years, but most observers expected he

would stay on long enough for Fleet to integrate its information technology systems with those of BankBoston Corp., which Fleet said it would buy in March [CW, March 22].

Instead, Zucchini will stay

only long enough to lay plans for the integration. The remaining work will fall to Joseph Smialowski, BankBoston's top IT executive and former CIO at Sears, Roebuck and Co.

Zucchini, who has been at Boston-based Fleet since 1987, said he plans to move to a suburb of San Diego, where he and his wife can pursue their passion for riding horses competitively. He said he envisions himself serving on corporate boards, going to the beach and dining at his favorite Italian eatery. "I can't wait to get out there," he said.

Zucchini fell short of saying he was put off by the giant task of merging the banks' systems. "It was a good time for me to go. ... They

have the [IT] skills to pull this off," said Zucchini, referring to the merger. "They can do this."

Art Gillis, president of Computer Based Solutions Inc. in Dallas, an IT consultancy to the banking industry, said Zucchini's decision didn't surprise him. "Why wouldn't he leave?" Gillis asked. "He's done this [type of integration] before."

Gillis said that the generous compensation afforded top CIOs can "turn many of them into multimillionaires." The task Zucchini was facing "has got to be one of the worst jobs in the world because of the incredible stress," he said.

Zucchini's departure is "a loss for Fleet," said Octavio Marenzi, an analyst at Meridian Research Inc. in Newton, Mass. "He had a reputation for getting things done — sometimes ruthlessly," Marenzi said, explaining that previous Fleet acquisitions Zucchini oversaw resulted in the scrapping of the acquired bank's IT systems and significant layoffs.

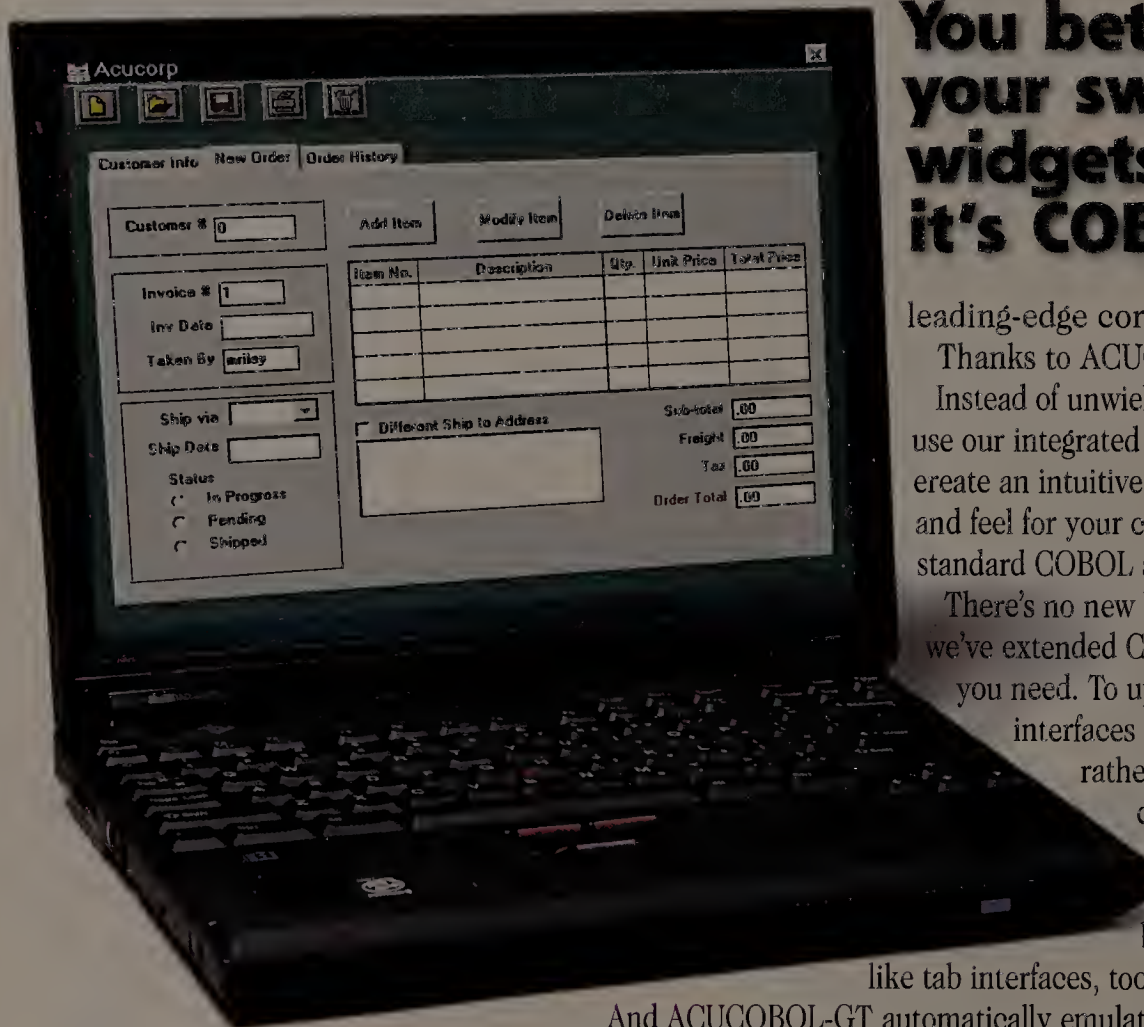
Smialowski is a relative newcomer to banking and is known for his strong leadership skills. Before joining BankBoston in December, Smialowski restructured the IT departments at Sears in an attempt to improve retention and provide career paths for longtime staffers [CW, Nov. 23].

Some questioned how someone with little banking knowledge could pull off the integration. Smialowski wasn't available for comment last week. ■



ZUCCHINI will stay on to help Fleet lay IT integration plans

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Novell Will Upgrade NetWare in Phases

Plans call for Web features, 64-bit support

BY SHARON GAUDIN

Novell Inc. will lay out the road map for its NetWare operating system this week at the Network/Interop '99 show in Las Vegas, piecing together previously announced plans for Web enhancements, multiprocessing and 64-bit computing.

The NetWare upgrades will come in a series of enhancements rather than in one fell swoop, said product manager Brian Faustyn. Rival Microsoft Corp. is taking the opposite approach with its upcoming Windows 2000 operating system. Though Windows 2000 will include several major new features, it has been on the drawing board for about five years, suffering several delays.

"Novell is consistently delivering products, and [Network/Interop '99] will just reinforce that," said Jamie Lewis, an analyst at The Burton Group in Midvale, Utah. "Novell splits their releases up so they're always coming out with something. That has really helped them get back on their feet financially, so they're going

to keep doing it."

Novell is slated to beta-test an add-on Web-enhancement pack for NetWare 5 this summer, Faustyn said. Code-named Cobra, the pack will in-

clude native HTTP support, IBM's WebSphere Web server and Oracle Corp.'s Oracle 8i database. Faustyn said a ship date wasn't available.

"I would love to get NetWare into the Web arena," said Rodolphe Jabbour, integration manager at Detroit-based Gen-

eral Motors Acceptance Corp., the financial arm of the automaker. "That would have a lot of cost benefits, and it would help us with remote management."

Lewis said Cobra could change the whole scope of NetWare. "We always think of NetWare as a file and print server, and this will change that," he said. "By making HTTP protocols native, you'll

be able to talk straight to the server with a Web browser."

After the Cobra release, Novell will focus on rolling out Six Pack, the code name for its multiprocessor version of NetWare. Faustyn said he couldn't give a release date for that shipment, either. The next step for NetWare will be to create a 64-bit operating system for Intel Corp.'s forthcoming Merced IA-64 processor. ▀

IN VEGAS, NET MANAGERS TO LOOK BEYOND LAN GEAR

Vendors at Network/Interop '99 to stress voice-over-IP products, Web-based services

BY BOB WALLACE

NETWORK managers who once handled only LAN hardware are finding they need to greatly broaden their knowledge base. That's because they're having to cover a wide array of emerging technologies that promise to improve the way their companies do business.

That's why many will attend

this week's Network/Interop '99 conference in Las Vegas. They plan to learn about things such as voice over IP, virtual private network (VPN) offerings, Digital Subscriber Line technology and new managed wide-area network services.

"If they don't stay up on them, they can't make the best decisions for their companies," said Chris Heckart, an analyst at TeleChoice Inc. in Boston.

The job has "gone far be-

yond routers, hubs and leased lines to what, without a doubt, is a huge spectrum of options," said Brett Frankenberger, a network manager at Union Pacific Railroad in Omaha. He's exploring voice-over-IP technology, which could help his company save money by making it possible to add voice traffic to Union Pacific's data WAN. "The technology is in its infancy, but we intend to stay up on it," Frankenberger said.

Similarly, James Ferry, net-

work manager at the Rio Suite Hotel & Casino in Las Vegas, is heading to the show to check out the latest in WAN services.

Double Duty

"We're looking at services that would link our properties at Ethernet speeds while carrying voice over these links," said Ferry, who will also check out advanced routers, which the hotel may need to put the two types of traffic on a single pipe. He said the single-site Rio began exploring WAN services after it was acquired in January by Harrah's Entertainment Inc., which has 16 hotels.

Russ Ketchum will "be looking at anything and everything to do with VPNs at the show with an eye toward things that would enhance or complement our VPN project." A systems manager at the Four Seasons Hotels Inc. property in Las Vegas, he's building a VPN to link the Toronto-based hotel chain's properties around the world so they can share guest-history data to provide a higher level of customer service.

In addition to sessions on everything from office-campus technology to Internet applications, the show will see several networking companies and service providers announcing offerings (see chart).

Analysts expect attendees to show strong interest in Web-related products and issues.

"With the pace of electronic commerce accelerating rapidly, network managers need to be up to speed on what their networks need to support electronic business applications," said John Morency, an analyst at Renaissance Worldwide Inc. in Newton, Mass. ▀

Cisco and HP Join Forces To Boost Policy-Based Nets

BY BOB WALLACE

Cisco and HP customers looking to set service levels for internal and Web applications received good news last week.

Cisco Systems Inc. and Hewlett-Packard Co. said they have forged a link between Cisco's network bandwidth tools and HP's server optimization packages that will enable companies to set policies that ensure performance across their enterprise networks.

Cisco's Assure Policy Networking package lets network managers prioritize traffic for applications that are more important than others, assuring them bandwidth even during times of congestion.

HP's Web Quality of Services (QOS) software lets information technology man-

agers give premium users or business units higher priority for access to, and use of, server resources than less important users or business groups.

Communicating Policies

For the first time, the two vendors are giving the HP package the ability to pass server policies to the Cisco tool, where they can be easily matched with the needed bandwidth.

"Together, they [will] let users set service-level agreements that cover response times across the network and into the server, which is in huge demand for things like transaction processing," said John Armstrong, an analyst at Dataquest in San Jose.

The synchronization of net-

work and server policies will be supported in a new version of the Cisco package and a new release of the HP package. Both are expected to ship in the third quarter. The two tools will work only with equipment from those vendors. Pricing wasn't available.

IT managers will use the Unix-based HP software release to prioritize transactions and traffic into a high or low group. That information is sent to, and stored in, a Lightweight Directory Access Protocol-compliant directory that HP bundles with its servers.

Cisco's next version of its Windows NT-based QOS Policy Manager will retrieve the data. Then the network manager and IT manager will negotiate performance levels, and the network manager will assign the necessary bandwidth to each application.

The vendors will demonstrate the packages at this week's Network/Interop '99 show in Las Vegas. ▀

Viva Las Vegas <i>A sampling of the new products on display at the show</i>	
HARDWARE/SOFTWARE	
Nortel: Convergence products	
3Com: Convergence products, new ATM switches and networking applications	
Lucent: Convergence products	
Cisco: Policy networking and switch enhancements	
Cabletron: Advanced routing switches	
SERVICES	
Sprint: Application delivery services	
MCI's UUnet unit: VPN service and ATM service enhancements	
IBM and Cable & Wireless: Global remote access service	
IBM Global Services and AT&T Solutions: Advanced business recovery services	
OTHER OFFERINGS	
Microsoft: BackOffice Server 4.5, which includes SQL Server7	
Computer Associates: Database tools	

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BRIEFS

DOJ Ups Focus
On Domain Provider

Network Solutions Inc. (NSI) in Herndon, Va., may be the target of a U.S. Department of Justice antitrust action. The company said it has been under investigation since 1997 and that it is "cooperating" with the probe.

NSI's actions have stirred up controversy, most recently when it routed traffic to its own Web site from the InterNIC, the National Science Foundation's domain name register.

EDS Reorganizes

Services giant Electronic Data Systems Inc. in Plano, Texas, last week announced a reorganization into five geographic units. It also said it will set up a new division that will focus on e-commerce.

IT Workers Shun
Government Jobs

Government agencies are having trouble hiring information technology workers because the agencies don't pay enough, can't offer bonuses and limit advancement opportunities, according to a survey of 342 government agency managers by the International Personnel Management Association and other groups. Government IT managers know they have to improve their hiring effort: About half of the federal government's 80,000 IT workers will be eligible for retirement by 2006 [CW, March 22].

Short Takes

KEYLABS INC. in Lindon, Utah, has established a Linux compatibility testing program for hardware with the backing of major vendors including **IBM**, **CALDERA SYSTEMS INC.** and **RED HAT SOFTWARE INC.** . . . The **WORLD WIDE WEB CONSORTIUM (W3C)** last week released the first public working drafts of its Extensible Markup Language Schema specification. . . . A group of IT vendors has donated \$500,000 in hardware, software and related equipment and services to help deliver Kosovo refugees news and information in their native language.

Sun Java Standards Switch Concerns Users

Company takes different approach to ISO approval in bid to control Java evolution

BY CAROL SLIWA

Sun Microsystems Inc. last week changed course, throwing its hopes behind a Swiss-based consortium to fast-track its Java technology to the International Standards Organization (ISO) by year's end.

Original plans called for Sun to submit its Java specification to ISO's Joint Technical Committee 1 (JTC1) by November.

But Sun officials objected to rule changes that they claimed would give the committee power to evolve the Java standard, even though JTC1 Chairman Thomas Frost insisted the rules' intent was simply to have the committee work with fast-track companies, such as Sun, on maintaining standards.

Sun scrapped its ISO fast-track status and turned to Geneva-based ECMA (formerly known as the European

Computer Manufacturers Association), leaving users and industry observers questioning whether the standards effort ultimately will address their major goals:

■ Letting them write cross-platform Java applications.

■ Thwarting Java fragmentation threats posed by Hewlett-Packard Co. and Microsoft Corp., which are teaming with other companies to finalize a real-time extension to Java — through the newly incorporated J Consortium — that is outside Sun's process.

Openness Questioned

Critics charge that Sun's ECMA maneuver is merely an attempt to put an independent-looking veneer on a Java standard that Sun ultimately will control. Indeed, Sun Vice President Jim Mitchell said the

ECMA process will leave responsibility for the evolution of Java standards to its community development process — an approach that lets any company, organization or individual participate in creating Java specifications. But opponents such as HP and Microsoft have charged that Sun ultimately controls that process.

Its opponents could interfere with Sun's ECMA strategy. Both HP and Microsoft are ECMA members; Microsoft's deputy director of standards activities, John Montgomery, said his company will be active in the process.

If ECMA standardizes Java and turns it over to the ISO, the standard will still be subject to a vote by the JTC1 — and, in turn, the maintenance rules that Sun is seeking to avoid. But Mitchell said the ECMA told him that the "issue of maintenance doesn't come up" when it submits standards as a consortium.

For some corporate users, a

JUST THE FACTS

Java Gyration

Sun is pursuing a new route to Java standardization because:

Sun's claim: New rules would have given the International Standards Organization's Joint Technical Committee 1 (JTC1) control of evolving the Java standard, not simply minor changes.

JTC1's claim: New rules are intended to ensure that the JTC1 work with any Publicly Available Specification (PAS) submission to maintain the standard. In this case, Sun was submitting the PAS to try to bring Java to standardization. The JTC1 said the rule changes resulted from a planned procedural review at the end of the PAS trial period.

Java standard is key to creating "stability in the Java market," said John Melka, manager of information systems tools at Bank of America's global, commercial and investment banking division in Chicago.

Others wonder if standards will solve Java's problems. "It takes a long time for something that's controversial to go to standard, and when it gets to that point, it still doesn't help," said Catherine A.T. Susch, a senior development manager at Ernst & Young LLP in New York. ▀

SUN TARGETS SERVICES,
APPS AT OUTSOURCERS

Initiative designed to grab market piece

BY JAIKUMAR VIJAYAN

SUN MICROSYSTEMS Inc., betting that most corporate users will eventually outsource everything from their e-commerce applications to Web sites, last week announced plans to offer bundles of products and support to outsourcing service providers.

Under its ServiceProvider.com initiative, Sun announced more than 20 product/support bundles to help companies offer outsourcing services ranging from application hosting to e-commerce and network management.

The move's aim is to position Sun as a one-stop supplier of products and support to application hosting services, Internet service providers, tele-

communication companies and systems integrators.

Sun's initiative follows a similar strategy, aimed at Internet service providers, announced about a week ago by rival Hewlett-Packard Co. [CW, May 3]. Both vendors are tapping into predictions that the market for outsourced services will increase dramatically in the next few years.

"We believe it is a new model [in which] users will no longer buy and install applications on a corporate network, but buy it as a service instead," said Ted Schadler, an analyst at Forrester Research Inc. in Cambridge, Mass. Much of the early demand is expected to be driven by small-to-midsize companies that can't afford or don't want to set up extensive information technology infrastructures of their own, Schadler said.

But some services, such as e-mail and Web-site hosting,

Users will no longer buy and install applications on a corporate network, but buy it as a service instead.

TED SCHADLER,
FORRESTER RESEARCH

could prove popular among larger companies, too, said Chris Hurst, a Sun vice president. Sun's ServiceProvider.com announcement includes four new applications: messaging, Internet portal access,

e-commerce billing and a business-to-consumer e-commerce application.

The applications include two messaging server software products — Sun's Internet Mail Server 4.0 and Netscape Messaging Server 4.1 — from the alliance formed by Sun and America Online Inc.'s Netscape Enterprise Group.

Sun Target

Digex Inc. is an example of the type of company being targeted by Sun. The Beltsville, Md., company provides Web and e-commerce application hosting services for a customer list that includes Nike Inc. and W. W. Grainger Inc.

As a result of Sun's announcement last week, Digex has started offering services based on Sun's i-Planet software, which allows corporate information to be accessed from anywhere on the Internet by authorized users via Java-enabled browsers.

"There is a lot of cost and time involved in hosting and running these kind of services," said Charlie Boyle, director of research and development at Digex. ▀

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LUCAS EMPIRE STRIKES FIRST

Star Wars maker warns service providers to guard against pirated copies of movie

BY STACY COLLETT

FROM MIDNIGHT sales of *Star Wars* paraphernalia to closely guarded movie previews, Lucasfilm Ltd. is keeping tight control over every aspect of its much-hyped *Episode I—The Phantom Menace*. But some legal experts say the film company went too far when it asked Internet service providers to police their networks to control possible bootlegging of the film or else face legal action.

Lucasfilm's legal counsel last month sent letters to 700 service providers alerting them that illegal copies of *Episode I* might show up on the Net. The letter also asked the companies to be responsible for finding and blocking access to any illegal sites they might find, as instructed by the Digital Millennium Copyright Act.

The problem is that policing Web sites isn't the provider's responsibility under the act,

according to legal experts. And though providers are in favor of stopping copyright infringements on the Internet, they just can't shoulder the responsibility.

The Lucasfilm letter states, "Please remove any such postings that are accessible on or through your systems or networks... or located using your information location tools, and

disable access to any sites fulfilling these criteria. Extremely prompt action will be required in order to avoid the spread of infringing materials."

"Lucas is turning the law on its head," said Marcelo Halpern, an attorney specializing in Internet law at Gordon & Glickson LLC in Chicago. "They need to know what the [illegal information] is and where to find it. The notice they sent was this blanket request."

Lucasfilm lawyer Terrence McMahon, an attorney at Or-

rick, Herrington & Sutcliffe LLP in Menlo Park, Calif., said the notice was meant to engender cooperation. "If we find [copyright infringements] on the Internet, there will certainly be further notices."

But some Internet service providers said they feel bullied by the notice. "It felt like they were asking me to police [our sites]," said Edgar Stephenson, copyright counsel at AT&T WorldNet Service in Morrisville, N.C. "I just don't have the people to go looking for problems."

"They feel that someone's trying to push them around," said Bruce Hahn, policy director of the Computing Technology Industry Association, a

7,500-member IT lobbying group based in Lombard, Ill. "It's virtually impossible to police a Web site on an ongoing basis. But once [a service provider] is aware, it should be their responsibility to discourage [bootlegging]."

America Online Inc. officials said they won't take any action until specific copyright violations are identified.

"We think the [Digital Millennium Copyright Act] provisions are pretty clear," said Randall Boe, AOL's general counsel. ▀

MOREONLINE

For links related to Internet copyright issues, visit our Web site. www.computerworld.com/more



THE STARWARS.COM SITE features a *Phantom Menace* trailer, but Lucasfilm wants to ensure no Web sites peddle the entire pirated movie

Continued from page 1

Net Scam

others were named in complaints filed by the Federal Trade Commission in January that accused the group of "unfairly or deceptively billing consumers for charges they didn't know about or authorize on their credit and debit cards."

Yet Taves was arrested by police last week on contempt charges for failing to repatriate overseas accounts and to reveal complete information about his financial affairs, including a \$6.2 million bank account in the Cayman Islands.

"What we have asked for is restitution and disgorgement, which means giving up ill-gotten gains," an FTC spokeswoman said.

The FTC alleged that since

early last year, Taves; his wife, Teresa Callei Taves; and their business partners billed hundreds of thousands of credit-card holders for services they didn't request, such as subscriptions to adult Internet sites. The group allegedly set up several fake companies and shunted the money to numerous offshore bank accounts, the FTC said.

Taves couldn't be reached for comment after his arrest. But FTC attorney Douglas Wolfe said Taves' lawyers argued that their client provided legitimate billing and access services for adult Internet sites.

Although Taves ran 15 of his own adult sites, his customer base and billing contracts with other sites would have generated only about \$4 million—not the estimated \$45 million he is accused of taking in, Wolfe said.

Go-between bill processors like Taves aren't unusual in adult entertainment, said Jane Duvall, whose Seattle-based site (www.janesguide.com) rates adult sites and monitors fraud complaints.

But Taves' numerous companies used some "pretty suspect" business practices, Duvall said. For example, users were routinely charged for an extra three months after canceling accounts, she said.

Donn Parker, a retired security analyst and author of the book *Fighting Computer Crime*, noted that e-commerce fraudsters often rely on automated programs to generate card numbers to bill with false charges.

When the Taves case goes to trial Sept. 28, more information will come out about how he and his group worked—a potential education for would-be scammers, Parker said. ▀

Continued from page 1

E-Banking

York. He cited a 53% drop in U.S. household market share that TV networks have experienced since 1975.

Many information technology executives attending The CIO Forum last week aboard the *Queen Elizabeth II* in New York Harbor said they felt hamstrung by their senior management's reluctance to change their organization's banking and trading models. And others said it's difficult to "Webify" institutional customers traditionally served by telephone.

Many bankers and brokers at the conference agreed with Horowitz's prediction about the threat posed by the Internet to financial services firms. It's getting there that's the tough part.

"You've got the older guys [in senior management] who don't trust the reliability and security of the machines, and the younger ones who want to do everything over the Internet," said Paul Cucurullo, CIO at Ark Asset Management Co. in New York. Horowitz said his unit rolled out a foreign exchange e-commerce system on April 1, backed by top executives. "If I didn't have the chairman's support, I wouldn't survive," Horowitz said, referring to Citigroup heads John Reed and Sandy Weill.

But that may be a notable exception. To date, few banks and brokerages have done much

more than post a simple Web site. Of the roughly 10,000 banks in the U.S., less than 10% offer Web-based services such as online banking or bill payments, said Octavio Marenzi, research director at Meridian Research Inc., a Newton, Mass.-based financial services consultant.

'I Want My Cash Online'

That's not much activity, despite the fact that 43% of U.S. adults said they want to bank online, according to a poll released last week of 2,027 adults conducted by Ivans Inc., a Greenwich, Conn.-based firm that builds e-commerce applications for insurance and health care companies.

IT veterans also said they have had trouble identifying useful applications for prospective corporate e-commerce customers.

For institutional investors, such as pension funds, for example, "it's easier for them to pick up the phone" to make a foreign exchange trade than it is for them to enter all the required information into a computer, said Michael Blazevec, vice president of IT/global markets at RBC Dominion Securities Inc. in Toronto.

Companies that have succeeded in e-commerce have created a value proposition or have made it easier for customers to do business online.

For example, Security First Network Bank in Atlanta makes it easier for customers to pay their bills online by presenting all bills on the same Web page. ▀



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NETWORKS OF CONFIDENCE





**“Since installing Windows NT on HP NetServers
determines downtime: me.”**

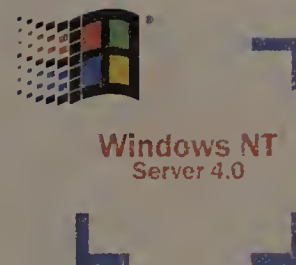




only one thing

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Ray Kump, Director of IT
Mitsubishi Electric Automation



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WESTERN UNION, UNISYS IN PC PACT

Unisys to deploy, support 20,000 desktop systems over 3 years

BY JAIKUMAR VIJAYAN

WESTERN Union Financial Services Inc. has outsourced its PC support to Unisys Corp. in a bid to improve customer satisfaction at its agent locations.

Unisys will deploy and support 20,000 desktop systems at Western Union's 18,000 money-transfer agent locations in North America in the next three years. The companies declined to disclose the value of the deal.

The move is part of a strategic initiative to enhance service levels at those sites, said David Hansen, vice president of agent support services at Western Union in Englewood, Colo. Unisys has been provid-

ing support services for Western Union's high-end systems, along with limited PC support, for 20 years.

The latest move specifies Unisys' desktop service-level obligations, Hansen said.

"What is new about the agreement is that we went back and redefined exactly what we required [in terms of service levels] from our maintenance partner" on the desktop, he said.

Downed PCs at any of Western Union's agent locations are expected to be replaced by the next business day, service levels will be monitored weekly and representatives from both sides will meet monthly to review desktop service levels, Hansen said. Previously, no such obligations existed.

"Improving service levels is the No. 1 reason why companies outsource" desktop services, said George Logemann, an analyst at The Yankee Group in Boston.

Decentralized management of desktop functions often results in companies having a few well-defined policies in place relating to desktop service levels, Logemann said.

And where there are policies, enforcement is often lackluster because there's no centralized organization responsible for it. With an outsourcer, "service-level agreements become an important part of the legal contract and often contain provisions for the enforcement of promised service levels" via financial penalties, Logemann said. ▀

New App Helps FedEx Parse Customer Data

Exchange's Valex software gives marketing pros direct access to 500G-byte database

BY STEWART DECK

Federal Express Corp. has trimmed by two-thirds the time it takes to roll out and assess the effectiveness of its direct marketing campaigns, from 26 months to eight.

FedEx's move last winter to use software from Exchange Applications Inc. in Boston came as the package carrier decided it needed to better manage its 500G-byte Oracle Corp. customer marketing database. Now the Memphis package carrier is seeing efficiencies.

FedEx has connected everyone in its corporate marketing department directly with its Oracle database using Exchange's Valex software.

FedEx marketers use Valex to divide high-potential customers into segments, then measure the results of marketing surveys. The marketers can then pitch tailored offers via direct mail and e-mail, conduct

surveys in various customer segments and measure their effectiveness.

"What we've done is cut out the analysis middleman and let [our marketing] people have dialogues with the database rather than asking someone to run a query and get hard-copy reports from the mainframe," said Ted Wicinski, marketing analysis director at FedEx.

"We needed an open system that could interface with other query and modeling tools," Wicinski said.

An older, proprietary campaign management system had become "too hard to maintain and too limited in its flexibility," he added.

Exchange's ability to scale to fit large installations and its open system approach lends itself to such best-of-breed interfaces, said Claudio Marcus, an analyst at Gartner Group Inc. in Stamford, Conn.

FedEx is looking to stream-

line that process even further this year with a new module that connects to predictive modeling software from SAS Institute Inc. in Cary, N.C. That will allow the company to do real-time predictive modeling.

"But we have to be careful we don't expand too quickly and make the system so complex that [our] users can't keep up with it," Wicinski said. ▀

IBM Launches Java Tools

Developers can build apps for embedded systems

BY CAROL SLIWA

IBM last week announced a beta version of a tool set designed to help developers build Java applications for devices such as cellular phones, autonavagation systems, medical monitors and consumer appliances.

VisualAge for Embedded Systems, Java Technology Edition — scheduled to ship this year — can help connect those

Bankers Resist Privacy Plan

Say Clinton proposal would impede service

BY ANN HARRISON

The nation's largest financial-industry trade association resisted President Clinton's proposal last week for legislation that would ban affiliated financial organizations from exchanging consumer transaction data without consumers' permission.

"If we passed into law what the president proposes, it will slow down the process to move on credit and loan applications. This view that people's information is being accessed inappropriately is not true," said John Byrne, senior counsel at the American Banker's Association (ABA) in Washington.

Notify Consumers

Clinton's plan for financial privacy and consumer protection supports legislation that requires institutions to inform consumers of plans to share or sell their financial information. The Senate is already considering such a bill; similar legislation is set to be introduced in the House.

Clinton's plan proposes \$5.5 million of additional funding to help the Securities and Exchange Commission prosecute Internet securities fraud and enhance the SEC's Internet surveillance capabilities. In addition, the plan recommends provisions against identity theft and the sharing of medical information with financial institutions.



CLINTON PROPOSES \$5.5 million in additional funds to, in part, prosecute Internet securities fraud

Byrne said the ABA supports the fraud and medical provisions. But he said restrictions on the sharing of consumer data with third parties without approval already is restricted by the Fair Credit Reporting Act.

The Federal Trade Commission, meanwhile, will this month conduct its second survey of online privacy practices at U.S. companies. The study is intended to help the FTC decide whether to ask Congress to regulate privacy on the Web or permit industry self-regulation. The survey will poll 300 Web sites to determine if they adhere to the U.S. Commerce Department and FTC privacy principles that govern the use of consumer data. ▀

ty creates the potential for more reuse of code.

Joe Demassa, an IBM vice president, said that although developers using VisualAge for Embedded Systems might have to rework an application for various screen sizes, they probably could reuse back-end connectivity code.

"There are quite a few tools for building embedded Java applications, but no one with the clout of IBM" has a Sun Microsystems Inc.-licensed product, said Anne Thomas, an analyst at Patricia Seybold Group in Boston. A trial version is available at www.ibm.com/embedded/. ▀

devices to enterprise back-end systems via the Internet. IBM hasn't set pricing yet.

Code Reuse

Small, specialized devices typically run unique operating systems. This has hamstrung past development efforts, because programmers could write applications for only one device at a time, IBM said. Java's cross-platform capabili-

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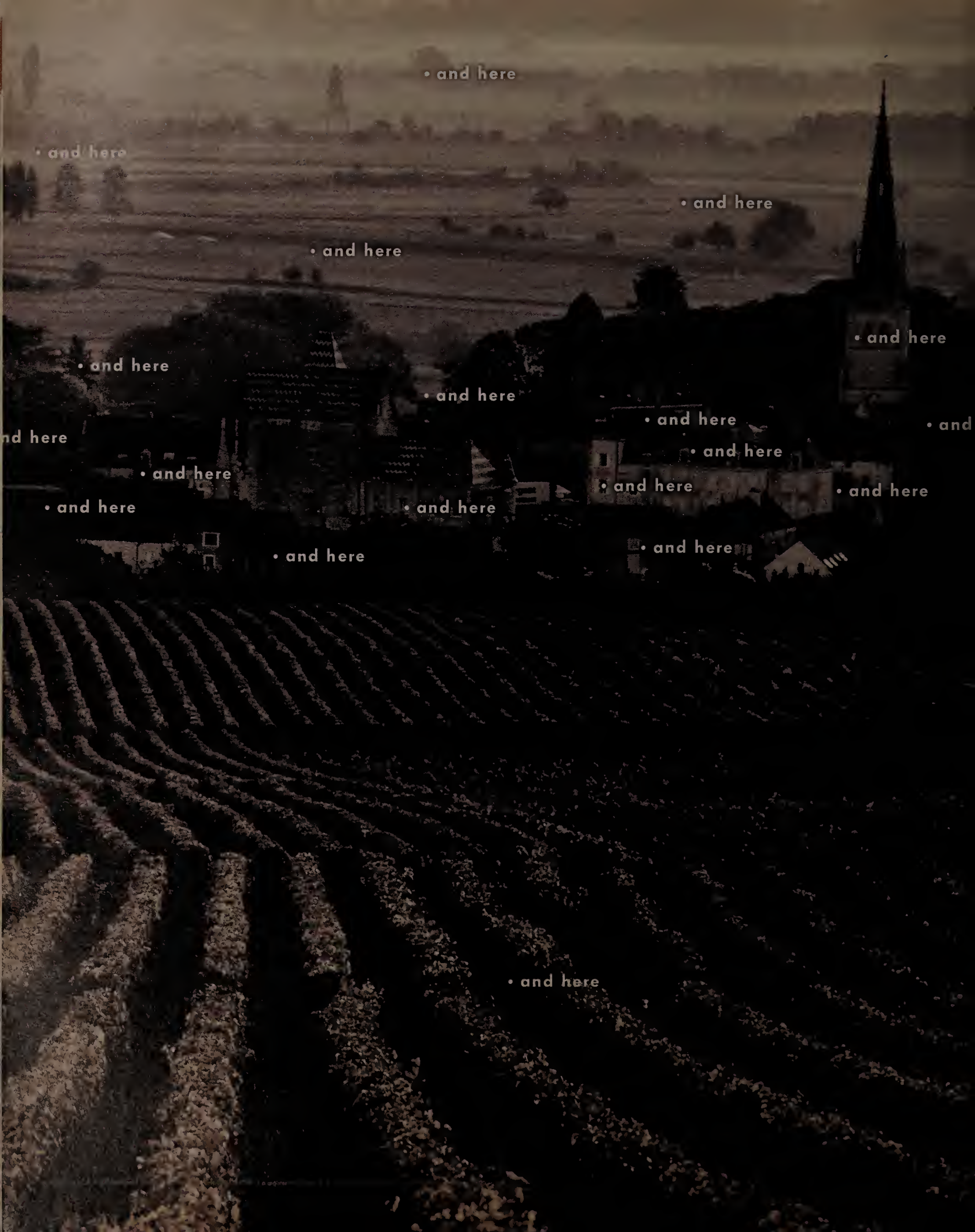
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CALDERA PUSHES FOR 'DOS' TRIAL

Microsoft denies charge, argues for bench verdict

BY KIM S. NASH

CALDERA INC., hoping to preserve a January trial date, last week filed papers in its antitrust suit against Microsoft Corp. to rebut Microsoft's contention that the case is without merit.

Caldera, a small Linux vendor in Orem, Utah, sued Microsoft almost three years ago, accusing the software giant of anticompetitive behavior in trying to outsell DR-DOS, an operating system now owned by Caldera [CW, March 29]. For example, the suit alleges that Microsoft spread fear among customers that DR-DOS wouldn't work with Microsoft's operating systems and

that it jiggered its software so that it appeared to work better with Microsoft's own MS-DOS. Caldera, which is seeking at least \$1.6 billion in damages, also claims that Microsoft illegally tied MS-DOS to Windows.

Microsoft has denied the charges. In February, it filed nine motions saying that, based on the evidence submitted so far by both sides, most of the case should be decided by the U.S. District Court judge in Salt Lake City without a trial. The judge hasn't ruled on those motions. But Caldera responded last week to three of them, vigorously arguing in favor of the January jury trial because Microsoft "mischaracterizes" many of the claims.

The case intersects with the U.S. Department of Justice's antitrust suit against Microsoft. Both suits accuse Microsoft of using its dominant market power to illegally preserve a monopoly

Caldera's 3-Year March

JULY 23, 1996 Caldera buys DR-DOS operating system from Novell; files suit against Microsoft alleging a string of anticompetitive acts

APRIL 28, 1999 Caldera files 188 pages to sum up major points in its case, citing previously secret Microsoft e-mail and internal documents as evidence; Microsoft calls filing an attempt to embarrass it and rewrite history

MAY 25, 1999 First of five hearings scheduled on the nine motions Microsoft filed for summary judgment, essentially saying that most of Caldera's claims are baseless

JAN. 17, 2000 Trial set to start

— in the DOS business, according to Caldera, and in the Windows business, according to the Justice Department. Both the Justice Department and Microsoft requested documents from Caldera last summer to use in the federal antitrust case.

On April 28, Caldera filed a summary of its case. It cited 449 pieces of evidence — much of it Microsoft internal e-mail and documents that previously had been secret. Microsoft dismissed the filing as an attempt to revise history, claiming that it was exonerated by the Federal Trade Commission and Justice Department in the early 1990s for many of the issues Caldera is pursuing.

After investigations by the two federal agencies, Microsoft signed a consent decree in 1994. It agreed, among other things, not to use certain potentially exclusionary license contracts.

Caldera was founded in 1994 with backing from Novell Inc. founder Ray Noorda. Novell sold Caldera the rights to DR-DOS on July 23, 1996, the same day Caldera filed its suit against Microsoft (see chart). ▀

Web Board Tackles Domain Naming Rights

Should .com names be set aside for firms' trademarks?

BY MATT HAMBLIN
NEW YORK

Does a company have a right to a ".com" domain name using its own trademark in the address? That's one issue members of the nonprofit Internet Corporation of Assigned Names and Numbers (ICANN) want feedback on, said interim Chairwoman Esther Dyson last week.

Dyson, also chairwoman of EDventure Holdings Inc. in New York, told a gathering of the Silicon Alley Breakfast Club here that she and the 19-member ICANN board want input on many domain name issues. Those include whether a company trademark should imply a company's right to use its name plus .com as a domain name, as in IBM.com, for example.

"Just because a company has a trademark name, should they be able to stop others" from having a similar domain name? Dyson asked. She said she hasn't taken a position on that issue.

Portola Valley, Calif.-based ICANN first met Oct. 25 and has spent much of its early existence discussing bylaws and its transition. ICANN oversees open competition for domain name registration for .com, .net and .org. ICANN is also seeking more input on whether additional domain name endings, such as .firm, should be created.

Registration for domain names had rested with Network Solutions Inc. in Reston, Va., which still maintains the domain name registry, a large database. ▀

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Group Wants Web 'Squatters' Squashed

BY TOM DIEDERICH

An international group is taking aim at "cybersquatters," people who register domain names that violate trademarks with hopes of selling them back to their namesakes at a huge profit.

The Geneva-based World Intellectual Property Organization (WIPO) is seeking the establishment of a dispute resolution policy that would empower the organization overseeing new Web site names to evict cybersquatters.

The Internet Corporation for Assigned Names and Numbers (ICANN) is overseeing the introduction of a new

competitive system for registering Internet domain names. Since 1992, Network Solutions Inc. in Herndon, Va., via its contract with the federal government, has been the sole registration agency.

WIPO is also recommending that domain name applicants be required to agree to the eviction procedure before they can receive final approval.

The group sent the proposal to ICANN in Portola Valley, Calif., last week. An ICANN spokesman said the proposal would be considered for adoption at a meeting later this month in Berlin. ▀

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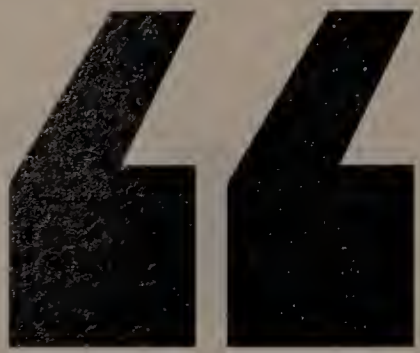
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SQL Server takes a big step toward enterprise capability and introduces dramatic ease-of-use improvements with version 7.0 of the database server.” –*PC Week*¹

“New features extend SQL Server’s performance and scalability...most of the changes will move SQL Server from the role of department server **into the role of enterprise database server.”** –*Windows NT*²

“SQL Server 7.0 boasts **impressive features** that administrators and users will both appreciate.” –*InfoWorld*³

“SQL Server 7.0 provides the flexibility, relational power, and continued ease of use that should put the product in **the corporate winner’s circle.”** –*Intelligent Enterprise*⁴

“We recommend that you consider SQL Server 7.0 for new data warehousing projects ranging from departmental and line-of-business **data warehousing even to the enterprise,** especially if you’re already a [Windows] NT shop.” –*Mitch Kramer, Patricia Seybold Group*

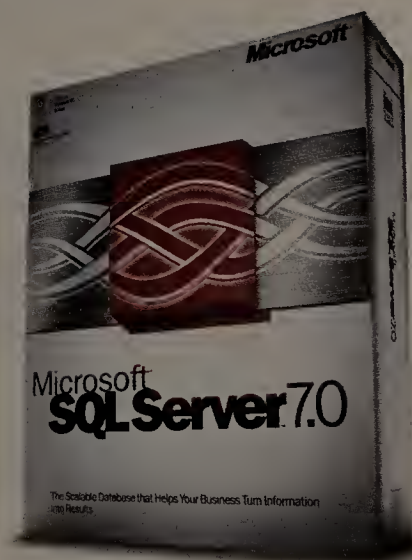
PC Week Best of Show, *COMDEX/Fall 1998*

**Database and Server Software
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INTERNATIONAL BRIEFS

Privacy Act Mulled

New Zealand Privacy Commissioner

Bruce Slane has recommended two amendments to the country's Privacy Act to bring it in line with the

European Union's 1995 Directive on Data Protection, which went into force last year. The directive limits exportation of personal data to countries outside the EU that don't ensure an adequate level of protection.

"I am concerned that New Zealand may fail the 'adequacy test' because of a lack of action on these two points," Slane said.

Such failure could have a significant impact on businesses in the region that handle personal infor-

mation about EU residents.

One provision of the Privacy Act limits to New Zealand citizens the right to access personal data, but Slane said that provision needs to be abolished so Europeans who formerly lived and worked in New Zealand have the same rights.

Also, the Privacy Act doesn't protect information from being transferred from New Zealand to data havens - countries that don't have adequate privacy protection.

- *Computerworld New Zealand*

Telmex/Sprint Nix Telecom Venture

Sprint Corp. and Telefonos de Mexico (Telmex) in Mexico City last week announced they will end their Telmex-Sprint Communications LLC joint venture, which was created to offer telecommunications services to Hispanics in the U.S. Telmex, which is Mexico's dominant carrier, plans to buy Sprint's share of the company once the companies obtain approval from the U.S. Federal Communications Commission.

- *IDG News Service*

Hong Kong Not Eager For Online Trading

Cultural barriers are hindering the adoption of online trading in Hong Kong, according to a speaker at Hong Kong's first Internet financial services summit last week. "Hong Kong's retail clients are by and large quite happy with the existing systems," said Gilbert Chu, executive director at Sun Hung Kai Securities.

Stopping off at the stock broker is a "cultural thing," and Hong Kong citizens see no reason to use the Internet instead, he said. But Chu said he expects online brokerages in Hong Kong to be "even more popular than in the United States" by 2003 if some inhibiting factors are overcome.

- *Computerworld Hong Kong*

Short Takes

Dutch enterprise resource planning software vendor THE BAAN CO. has closed its Philippines office, barely eight months after it opened, *Computerworld Philippines* reported last week. . . . It's taken some perseverance, but PHILIPS ELECTRONICS NV in the Netherlands last week signed a deal to acquire U.S. chip vendor VLSI TECHNOLOGY INC. for about \$1 billion.

1 - 8 7 7 - I T L E G A C Y



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BRIEFS

Informix CEO Named

Informix Corp. has named Jean-Yves Dextrier its CEO and president, succeeding Bob Finocchio, who served in that role since July 1997. Finocchio will become chairman of the Menlo Park, Calif., company when the changes are officially made on July 16.

The timing of the move — if not the move itself — was unexpected, said Jim Pickrel, an analyst at Hambrecht & Quist Inc. in San Francisco.

Pickrel, who said Finocchio had told analysts he wanted “more personal time,” credited the former 3Com Corp. president with a turnaround at Informix, which lost \$357 million in 1997 but posted a \$7.2 million gain for this year’s first quarter. Dextrier headed worldwide field operations at Informix.

HP, Hitachi Announce Storage Deal

Hewlett-Packard Co. and Hitachi Ltd. said they will combine forces to build storage systems for the enterprise and storage-area network markets. As part of the three-year deal, HP said it will combine its storage management and Fibre Channel technologies to boost the performance of Hitachi’s high-end disk arrays.

X86 Vendor Drops Out

Pointing to the financial beating it has taken in recent quarters, National Semiconductor Corp. said it’s getting out of the PC processor business. The Santa Clara, Calif.-based company made two lines of Intel-compatible, x86-based processors, one of which it acquired in its 1997 purchase of Cyrix Corp.

The company also announced it will cut 550 jobs, about 5% of its workforce, and take a \$250 million charge. It said it will focus on making chips for set-top boxes and portable Web devices and will continue to make analog processors.

HP Acquires Dazel

Hewlett-Packard Co. acquired Dazel Corp., an Austin, Texas-based maker of software that speeds the transfer of a company’s internal documents. Terms weren’t disclosed.

DYSON SEES MARKET DIP FOR NET STOCKS

Internet pundit warns even a few Y2K bugs will rattle investors, roil some high-fliers

BY MATT HAMBLIN
NEW YORK

MANY observers think Internet stocks have been grossly inflated. Investment angel, author and electronic activist Esther Dyson is ready to pinpoint their decline.

“This [Internet] industry is nuts right now,” Dyson told a crowd of 200 investors and Internet business leaders at the Silicon Alley Breakfast Club meeting here last week.

For investors, buying shares or launching Internet start-ups is “hard to resist, but it’s not going to last,” she predicted.

Dyson said she expects a market correction when year 2000 computer problems hit. Although she doesn’t foresee any systems disasters, she said elevator failures would prompt “a real change in sentiment” toward the technology sector and cause people to notice that

Internet companies aren’t making money.

“I don’t care how many eyeballs you get... or how much revenue,” she said, adding that investors’ focus should be on profits.

Dyson said the Internet space has many business proposals and ideas but not enough leaders who are able to run successful businesses.

Looking for ‘Spark’

When she reviews proposals for Internet-related businesses, Dyson said, she tries to “look for a spark in a person.... Funding an idea has always been a mistake.”

Dyson is chairwoman of EDventure Holdings Inc. in New York and interim chairwoman of the non-profit Internet Corporation of Assigned Names and Numbers in Portola Valley, Calif.

Her views about the eventu-

al decline of Internet stocks brought agreement from several people in the crowd who were interviewed. But not all foresaw 2000 as the trip point. There also were believers in the future of Internet



ESTHER DYSON, author and electronic activist, says she expects a correction in the Internet market when Y2K problems hit

commerce.

“I’m not hearing those same predictions of dire consequences — although there are

too many cooks” in the Internet business, said Arthur E. Cohen, vice president of advertising at ACTV Inc. in New York, a company that develops advertising and promotional ties between Internet and television viewing. “I wouldn’t go so far to predict doom and gloom because the Internet’s a very robust medium” for users and advertisers, he said.

Value Remains

Bernardo Joselevich, president of The Duty Free Guide Inc. in New York, led the launch of www.dutyfreeguide.com late last month. “Everyone agrees there will be an [Internet] crash, but that does not mean people won’t still find value” in the Internet medium, he said.

“Sure, the Internet stocks will flame [out],” said Rick Templeton, managing director of mergers at Hilbert, Peers & Young Inc. in Bronxville, N.Y. “The stock values are crazy, and most companies don’t have profits. But I don’t see the shakeout as early as January.”

MORE THIS ISSUE

Esther Dyson seeks input on trademark names for Internet domains. See page 24.

Dutch Firm Buys Wang In IT Services Deal

Merged entity has big Europe presence

BY BARB COLE-GOMOLSKI

U.S. customers are likely to feel little impact from last week’s

buyout of Wang Global by a Dutch information services firm, according to analysts.

Former hardware maker Wang Laboratories Inc., which shifted its focus entirely to information technology services in recent years, agreed last

week to be sold to Amsterdam-based Getronics NV for about \$2 billion.

Its pairing with a European company makes sense, analysts said. Billerica, Mass.-based Wang has put a lot of focus recently on building up its business overseas.

That strategy appeared to be paying off. Wang announced large outsourcing contracts in recent months with Abbey National, a large British bank, and British Airways PLC. It also landed U.S. contracts with First Union Corp. and Hughes Network Systems Inc.

“You need to grow or die in this business,” said Lucy Flynn, a Wang senior vice president. Flynn said the combined company will have 33,000 employees and annual revenue of more than \$5 billion.

Wang’s speciality is convert-

ing older, proprietary networks to standards-based networks. Getronics offers similar infrastructure services “but does more consulting and application development than we do,” Flynn said.

Not a Bailout

Although Wang last week posted a loss of about \$58 million (and announced revenue of \$790 million) for the quarter ended March 31, the sale wasn’t a financial bailout, Flynn said.

The loss was attributed to restructuring charges and a \$380 million reinvestment in Olsy SpA, the services arm of Italian vendor Olivetti SpA, which Wang purchased last year.

“Wang has done a good job of putting its services offerings together, and this should only enhance [its] ability to carry out its plans,” said Dean Davison, an analyst at Stamford, Conn.-based Meta Group Inc.

Wang’s Roller-Coaster Ride:

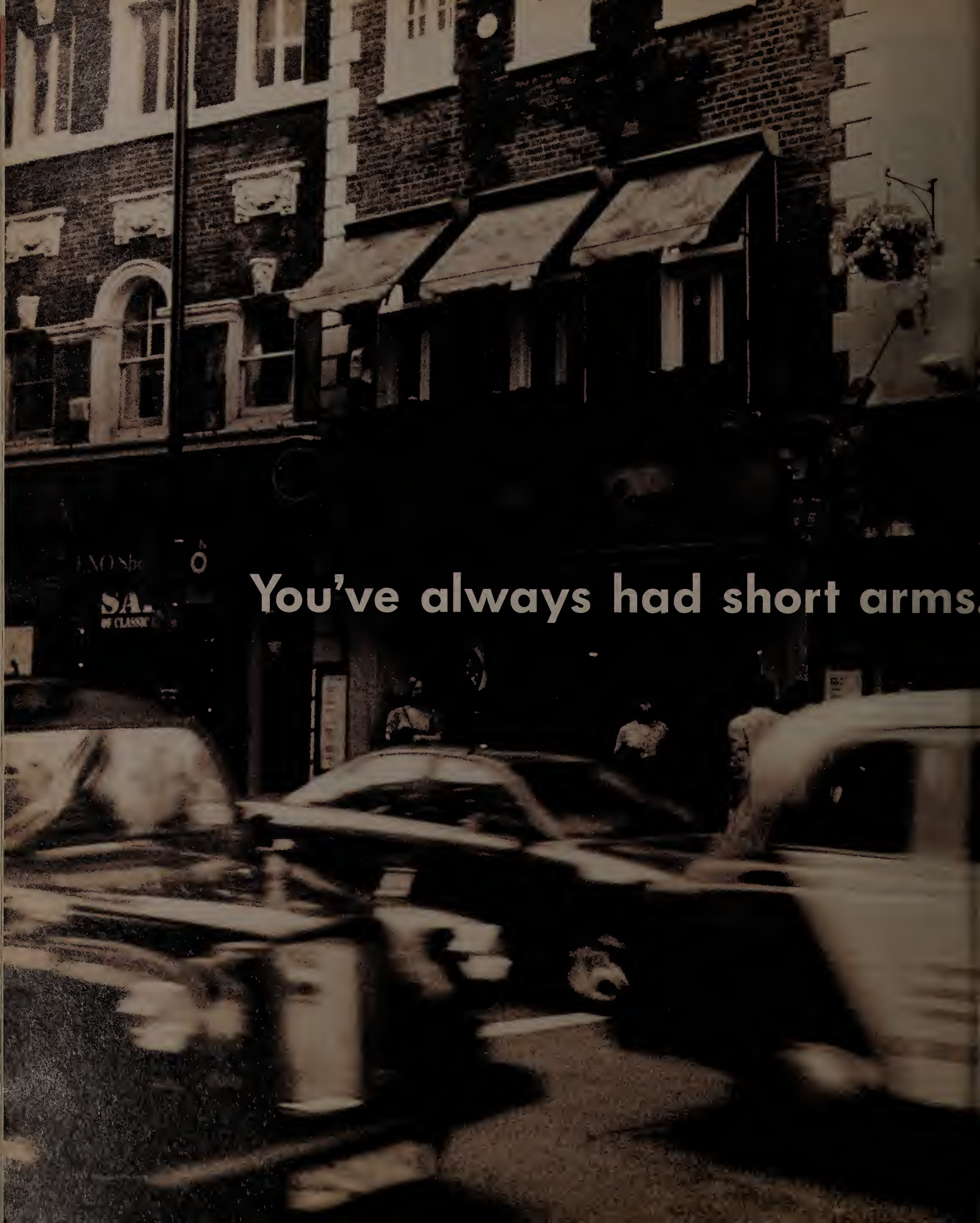
DURING THE 1970s and early 1980s, Wang rose to become one of the top makers of minicomputers

BESET WITH PROBLEMS, including a poor showing in PCs, management turmoil and a proprietary mind-set, Wang filed for bankruptcy in 1992

WANG EMERGED from bankruptcy in 1993, and in 1997 repackaged itself as a services firm

LAST YEAR, Wang bought Olsy SpA, Olivetti SpA’s services arm

LAST WEEK, Wang agreed to be bought by Getronics



You've always had short arms

And sure enough, you can't catch a cab to save your life. Meanwhile, your wife is waiting, waiting, waiting. Enter e-services. You send out a signal on your PDA. Global positioning pinpoints your location. Instantly, your electronic request for a cab is bid out and matched to transportation services around the city based on rates and proximity to you. You're given the option of a cab (five minutes away) or a limo (ten minutes away). You opt for speed (wise man). You have a few minutes to kill, and since you're not frantically trying to throw yourself in front of a cab, you duck into a flower shop (very wise man). As you emerge, your ride pulls up. **Think about this.** Soon there will be a plethora of services seamlessly and invisibly linked to the Internet. Services that you can charge for. Electronic services. The next chapter of the Internet is about to be written. The service-based economy is about to explode. And it will have nothing to do with you working the Web. Instead, the Internet will work for you. www.hp.com/e-services

The next E. E-services.

JOSEPH E. MAGLITTA

Digital masks

I'M NOT SURE WHAT CHANGED my mind: the e-mail from "Jessica 23145," who was dying to talk dirty with me; the local official fired for pseudonymously posting obscene remarks in an online town forum; the faceless, new Nazi poison in newsgroups; another youth lured to a motel-room death by a chat-room molester; or the chilling blur of role-playing and reality that shrouded two dead, teen-age killers in Colorado.

But lately I've been thinking: There's less and less room for anonymity in cyberspace.

Deeply cherished notions about a "free" — whatever that means — and unfettered online world, which so stir our democratic idealism, are strained by the ugly exceptions above, and countless others like them. In each case, the harm came from people hiding behind electronic masks.

The offenses of predators and spammers speak for themselves. But the Littleton shooters shocked far more deeply, partly because their violent online personae exploded murderously into the real world, fusing digital and earthly masks of hate.

The Internet teems with examples of injurious anonymity.

Most of us were taught to take responsibility for our actions. We teach our children the same. Does all that dissolve in cyberspace? Should we act online in ways that we never



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would in real life? We insist that we know and trust our company's electronic trading partners, but do we accept less for ourselves and our children? Surely not.

Ironically, the possible exception might be right here in the corporate world. It's a rare company that wouldn't benefit from an anonymous online dialog between workers and management.

Several weeks ago, the young founders of Zero Knowledge, a Canadian start-up, explained how their Total Freedom Internet masking software might enable open online speech in a totalitarian society. Or let someone check the Web for AIDS information without some insurance company finding out. Good idea, I thought.

Here's the question: Do we underwrite the legitimate need for online anonymity among perhaps 10% of the population by diminishing the safety of the other 90%? After the last month, I'm not so sure. ▀

JOHN GANTZ

Will relational databases leave dinosaur tracks?

I HAPPEN TO BE OLD enough to remember when relational database management systems came of age. What a concept: put data into giant tables where the rows and columns defined something about them. That was a giant advance in terms of making data useful over the record- and field-based databases of the day. But RDBMS didn't catch on immediately. They were slow, unstable and poor at complex tasks. In the beginning, they were pigeonholed as decision-support tools. It took Oracle a while to gain enough respect from the major database vendor — IBM — to cause Big Blue to enter the market (with DB2). Having a more or less standard language, SQL, helped.

Now relational databases rule, accounting for about \$11 billion of a projected \$13 billion market this year. Most of what's left is being spent on legacy database technology and a smidgen on object-oriented databases.

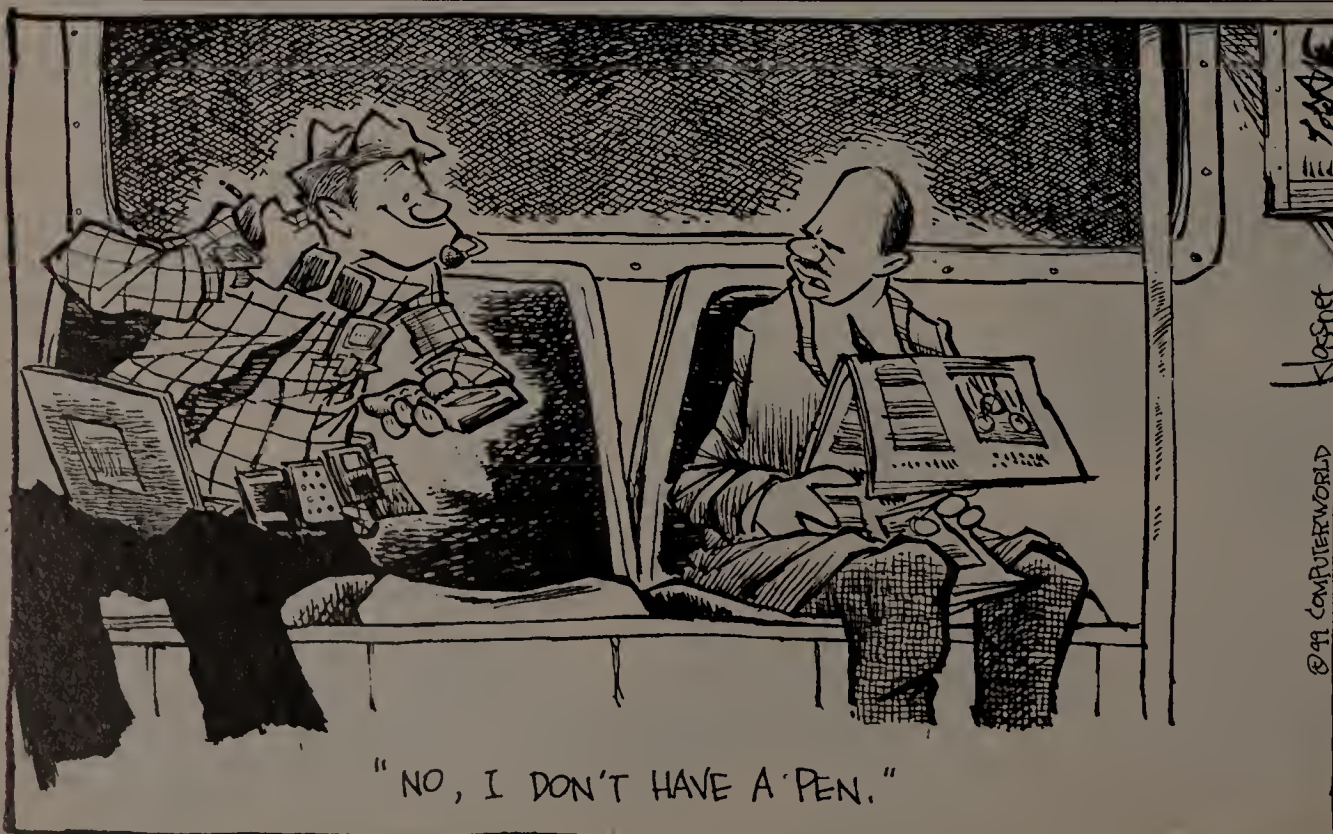
But last week, I was at a developers' conference for InterSystems, a Cambridge, Mass.-based software company that markets a product called Caché, and I began to think that there may be a chink in the RDBMS armor. As a DBMS, Caché falls into the category of "postrelational," but it's descended from a prerelational technology that was geared for multidimensional data models and transactions. It's got good genetic material inside. What Caché offers on top of that is object orientation along with SQL access and interoperability with other databases. Sort of the best of all possible worlds. And Caché is fast.

Now all the RDBMS vendors are charging into the object world, with extensions of their products that migrate them into the "object relational" category. The problem for the RDBMS vendors is that they worked for years to get their systems up to production transaction speeds, and now they have to graft object capabilities on top of that. They need to be relational, transaction-oriented and object-oriented all at the same time. They can't be optimized in any one direction.

For the time being, they own the market. But in the era of big databases and zillions of objects —



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thank you kindly, Mr. Internet — I can see them getting stretched beyond their natural design points. New technologies will have a chance.

I don't know if it will be Caché that changes relational databases as we know them, but something that's many times faster than today's typical RDBMS and that can store and manipulate millions of objects at a time will be needed. If Oracle, IBM, Sybase, Informix and Microsoft don't come up with the product, they'll be on a side spur of the DBMS evolutionary line. ▀

DAVID MOSCHELLA

Lots to learn from MediaOne acquisition battle

LET'S FACE IT. It's easy to feel a bit numbed by all these multibillion-dollar telecom mergers. So few of these deals have actually affected our day-to-day communications usage that it's tempting to believe that it's all just a game, one designed first and foremost to enrich its inner circle of participants. But even if you're bored by all the wired and wireless couplings of the past few years, you still might want to pay attention to AT&T's push to dominate the U.S. cable-television business by acquiring MediaOne Group. With the local telcos moving slowly with Digital Subscriber Line technology, cable-based services have a good chance of gaining at least a temporary monopoly position in high-speed consumer services. More broadly, this particular bidding war tells us much about our industry. Here are five lessons worth pondering.



DAVID MOSCHELLA is an author, independent consultant and weekly columnist for *Computerworld*. Contact him at dmoschella@earthlink.net.

to having a reasonable chance of becoming its single most important player. Back in the 1980s, many people hoped Armstrong would succeed retiring IBM CEO John Opel. But IBM went with the ultracautious John Akers and lost billions, and Armstrong left to run Hughes. Who knows what would have happened had the board made a different decision?

1. The value of strong leadership can't be overestimated. Just look at the difference AT&T CEO Michael Armstrong has made. His company has gone from being adrift and at odds with the Internet industry

to having a reasonable chance of becoming its single most important player. Back in the 1980s, many people hoped Armstrong would succeed retiring IBM CEO John Opel. But IBM went with the ultracautious John Akers and lost billions, and Armstrong left to run Hughes. Who knows what would have happened had the board made a different decision?

2. The IT industry stands pat for now. AT&T has

made a princely \$54 billion bid for MediaOne, but potential Comcast allies Microsoft or America Online have clearly opted not to.

In fact, Bill Gates or Paul Allen could have done it personally. But at press time, it appeared that none of the Internet billionaires would choose to act. Instead, Microsoft has decided to simply buy its way forward, investing \$5 billion in AT&T in return for certain Windows CE and other commitments.

3. Bandwidth is where the money is. The prices being paid for once-sleepy cable TV stocks are approaching Internet-like levels. MediaOne currently has only 5 million customers scattered across 17 states.

After some restructuring, AT&T is effectively willing to pay approximately \$5,000 per customer. AT&T's thinking is that, coupled with its control of TCI and @Home, MediaOne would make it the dominant player in the overall cable market. That's why Microsoft and especially AOL are so worried.

4. The FCC doesn't have a chance. It's just not possible for a few diligent but semi-informed bureau-

crats in Washington to sort through the vast complexities of these transactions. Would a strong AT&T accelerate local competition or stifle innovation? Would consumers be better off with Microsoft in control? There are no easy answers. Expect FCC Commissioner Kennard and company to act very concerned but do almost nothing.

5. Beware of entangling alliances. As George Washington once warned, commitments shouldn't be entered into lightly. The strategies of AT&T and Comcast are greatly complicated by various outside interests, especially those with Time Warner and Microsoft.

Coopetition and various incestuous business dealings have often made sense in the IT industry's confusing and rapidly changing environment. But when it's time to make the really big bets, it's nice to separate friend from foe.

Make bold decisions; take advantage of bandwidth; tap into Internet money; be careful whom you partner with, and don't expect any help from the government. Sounds like pretty good advice. We can't participate in the cable wars, but maybe we can learn from them. ▀

READERS' LETTERS

CA's gray hat

WITH REGARD to your question as to whether CA threw out its black hat three years ago ["A New CA? Prove It!" CW, April 5], I can attest that if it bought a new white hat, it was less than a year ago.

I became a CA customer through the Pan-sophic acquisition. I had a permanent license for Easytrieve, for which I was not obligated to purchase maintenance each year.

Last year, CA threatened to sue my company for over 10 years of the maintenance fees I had elected not to buy, even though my license for Easytrieve specifically said I was not obligated to pay.

We settled out of court for less than half of what CA wanted, but in essence, I paid for something I never used — something that didn't cost them anything, and they knew it.

Wayne Baldwin
Bensalem, Pa.
www.balford.com

I AM RESPONDING to the following information about Computer Associates' acquisition of Platinum Technology ["CA Buyout Worries Platinum Users," CW, April 5]: "Platinum customer James Rice, who also uses CA's Unicenter software, said he is worried about continuing support. CA 'has a reputation for destroying competitors' products' it acquires — such as Ingres from Ask Computer Systems Inc., said Rice..."

Happily, CA did not live up to its reputation with the Ingres acquisition. Since then, CA has done an excellent job enhancing and supporting Ingres. First, it completed the rollout of OpenIngres 1.1 begun under Ask and has since brought out OpenIngres 1.2, OpenIngres 2.0 and IngresII, which have shown progress in features and reliability. Our support costs about half as much as under Ask and now includes phone support instead of upgrades only.

I don't know about

CA's previous acquisitions in the mainframe arena, but in my opinion, they saved Ingres from an almost sure extinction.

Lucky Leavell
Corydon, Ind.
lucky@UniXpress.com

Be fair to your hires

I SEE TROUBLE brewing for employers like Mirronex Technologies [CW, April 5, "Upping the Ante"]. So the employer had five openings. He hired three people using "traditional means" but got two others by offering a BMW. I can just hear the talk around the water cooler:

Traditional Hire, looking out the window: "Wow, great car! Wish I could afford one."

BMW Hire: "What? You mean you didn't get one when they hired you?"

At which point, the traditional hire marches angrily to the human resources office to find out why she doesn't rate a BMW for signing on.

No doubt, "creative methods" are required in

today's hot market. Companies must exercise extreme caution, though, to avoid morale trouble down the road.

Laura Bray
San Antonio
laurabray@oaug.com

Good-bye, Rich

CARTOONIST Rich Tennant's gain in time will be *Computerworld's* and its readers' loss of a weekly source of humor and satire. His sharp pen and sharper wit will be missed, but I'm sure that all his fans wish him all the best with his future projects.

Gil Gordon
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COMPUTERWORLD welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Maryfran Johnson, Executive Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 875-8931; Internet: letters@computerworld.com. Include an address and phone number for immediate verification.

LENNY LIEBMANN

Say hello to the 'Lintel' Reformation

LINUX — NOT WINDOWS — is breathing new life into a tiring Intel platform. Most of the attention being given to Linux focuses on its open-source model of development, distribution and support.

But the most compelling attribute of the little-OS-that-could isn't how it got written. It's how well it works on x86-based chips.



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Simply put, Linux on Intel — which we might as well start calling "Lintel" — delivers about three times the price/performance ratio of any other computing platform. Lintel will run most processes three times faster than Windows NT on the same hardware, and you won't have to reboot twice a day.

If your company is running one of the big boys' proprietary Unix

platforms, you can get comparable box-for-box performance from Lintel and cut your hardware costs by one-third.

Those aren't just lab numbers. They're the actual experiences of the dozens of early adopters I've spoken to — from industrial heavyweights like BFGoodrich to e-commerce hopefuls like Deja News. Users surveyed by Datapro Information Services rank Linux higher for performance and reliability than both Sun Solaris and Windows NT.

Linux is breathing new life into the Intel platform just when it needs it most. The incremental improvements in x86-based architecture aren't knocking anyone's socks off. Even those gains are being eaten up by the increasingly bloated Windows operating system.

But with Linux, you can even get 486 machines to give you enough performance to serve a purpose. Plus, it's cheap. And sometimes, you can even get faster tech support answers from the so-called "community" than you can from your pay-to-play operating system vendor.

For you history buffs, the situation reminds me of the Protestant Reformation — with Linus Torvalds playing the part of Martin Luther. As the story is usually told, Luther's 95 Theses set off sweeping changes throughout Europe. That's only partially correct: Few people then had sufficient understanding of things theological to com-

prehend what Luther was talking about.

But Germany's princes realized that his ideas could be used to throw off the yoke of the Catholic Church. And so they seized on resentments against Rome and the papacy to dissolve the church-and-state duopoly of the time.

Cast Intel as the German princes and Bill Gates as the pope, and you'll see where I'm headed. The Linux story isn't about open-source religion — it's about power and freedom. You don't need to ascribe to the tenets of Torvalds to be a Linux advocate. You just have to want to determine your own computing destiny without compulsory "indulgences" paid to Redmond.

To extend the analogy, publishing source code is like printing Bibles in everyday German — it's a noble enterprise that lets people think and act for themselves. But when you change the balance of power, things really start happening. Borders change. Allegiances shift with the wind. Fortunes are made and lost. That's what the Lintel Reformation is really about.

So it might be a good idea to stop talking about the doctrines of Linux and start concentrating on the power of Lintel. Whether you adopt his open-source theology or not, Linus Torvalds' operating system could mean unprecedented power and independence for IT for many years to come. Do you really want to miss out on that? ■

GARY H. ANTHERS

Computer security bombs at Los Alamos

THE WORD MOST OFTEN associated with security these days is "lax," whether in reference to school shootings, attacks by computer viruses or thefts of nuclear secrets. You almost never see a headline that says, "Calamity averted; strong security cited."

But when I recently visited the Los Alamos National Laboratory in New Mexico — from which lab scientist

Wen Ho Lee is suspected of having stolen nuclear secrets — I would hardly have described the security as lax.

To get into the supercomputer center, you have to enter a tiny air lock-like chamber. A door shuts behind you, you put your palm on a scanner and if the computer recognizes your palm print



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and agrees you have the proper clearances, the second door swings open, and you are admitted. I wasn't cleared, of course, so I had to be escorted by a guard through a special passageway.

Once I got into the center, I was startled to see big red signs posted everywhere warning that an uncleared visitor — me — would be in the area that day. My visitor's badge was checked and logged wherever I went in the sprawling complex, and I was advised to leave my briefcase behind so it wouldn't have to be searched repeatedly.

When I told my escort how impressed I was with the tight security, he just laughed and said it was nothing compared with the protection for the building where the most sensitive nuclear weapons work goes on.

So what are we to make of the appalling lack of security that apparently allowed Lee to transfer huge amounts of top-secret software and data from a highly secure system to an unclassified network?

We may never know if the secret files were given to China, or what, if anything, China has done with them. But the possibilities are scary indeed. The U.S. agreed in 1992 to end nuclear weapons testing on the belief it had such sophisticated computer models that weapons could be tested entirely via software. The models are accompanied by data from decades of real bomb testing.

Although the software and data may not be sufficient to enable someone to make an exact copy of a U.S. weapon, they clearly would be of enormous value to any nuclear weapons program. That's especially so for China, which has also signed the test-ban treaty and so must rely on computer simulations.

It's a basic tenet of security that you invest effort to protect your assets in proportion to the product of two factors: the likelihood that attempts will be made to breach your facility or system and the cost to you if those attempts succeed. At Los Alamos, risk times cost equals infinity squared.

Nevertheless, security efforts apparently fell short. That suggests two lessons, neither of them new. First, computer security is often neglected compared with physical security because systems and attacks against them are often invisible — out of sight, out of mind. Second, the vast majority of computer crimes are committed by insiders unaffected by many of the standard protective measures, such as firewalls.

Los Alamos' Web site, www.lanl.gov, contains a curious mix of public and inside information. You can, for example, access the daily employee bulletin and see what's in the cafeteria that day or learn that the Salary Policy Committee will soon hold a meeting. The employee phone and e-mail directory is also available. I was reassured to see that Lee is no longer in the directory and that there's no button labeled, "Click here to download atomic secrets."

At the top of the home page, it says, "The lab's central mission is to reduce the global nuclear danger." We can only pray that lax computer security has not greatly increased it. ■

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BUSINESS

COMPETITORS AS CUSTOMERS

State Street Bank used to focus on the unglamorous back-office part of money management. Now it's aiming to be *the* online trade site for institutional investors with a site that even brings in money from competitors. **▶ 38**

DEAD END ON MOMMY TRACK?

Are IT women on the Mommy Track setting their own pace or falling behind the pack? In Ms. MIS, Kathleen Melymuka gets answers that are far from unanimous — and may not be specific to women. **▶ 52**

LEASE SUCCESS

Dow Chemical just renewed a lease for thousands of PCs from IBM, after slashing support and maintenance costs 30% during the original three-year deal. Dow staffers did it using a good lease and standardization. **▶ 42**

STARTING FRESH

What do you need to do to build the infrastructure for a luxury travel service when you start with a budget of \$10 million to \$20 million? Think data warehouses, the Web and good financial systems. **▶ 45**

IGNORE THIS FORECAST

Want to know how to plan for the future? Start by ignoring analyst pre-

dictions, Peter G. W. Keen writes. Stay alert, test everything and think about how the future has to change if your company is going to be successful. **▶ 48**

BUNDLES OF Y2K TROUBLE

Have you installed new, Y2K-compliant versions of packaged software? Feel good about it? Don't. If the application that's fixed works with a database or other app, you could have problems where you thought you already had solutions. **▶ 40**

A GOOD BACKUP PLAN

First Union Corp.'s voice-response system got swamped by financial services customers, forcing it to route them (at \$3 a pop) to live operators. A backup did the trick but only because it knows customers as well as the main system does. **▶ 43**

ONLINE JOB SEARCH TRICKS

Searching for a job online can be convenient or convoluted, depending on how you go about it. We tap the experts to come up with guidelines on how to streamline your search and where to get help when you need it. **▶ 56**

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Year 2000 40



DU PONT CIO Robert R. Ridout says his company outsourced 75% of its IT operations in 1997

HOW EXTREME IS THE RISK?

DU PONT AND GENERAL DYNAMICS outsource as much as three-quarters of their IT operations, and things are going great. Even with more work, the operations run more smoothly than before. But recent studies suggest that the more of IT a company outsources, the more likely it is that the deal will fail. Keys to success? Define the details; let your outsourcer win, too; and keep the really important stuff in-house.

50

IS STATE STREET THE E-SCHWAB OF INSTITUTIONAL TRADING?

Boston-based bank aims to achieve online pre-eminence in global trading

BY THOMAS HOFFMAN

STATE STREET CORP. handles the back-end accounting and book-keeping for more than \$5 trillion worth of bonds and stocks, making it one of the world's biggest players in financial markets.

Now the Boston-based bank is gunning to become the Charles Schwab Corp. of the institutional investment community.

Since 1996, the bank has been rolling out a series of online trading and research systems that are intended to help investment banking customers like Tokyo-based Nikko Asset Management Ltd. and Nomura Asset Management trade foreign exchange, equities and other financial instruments faster and cheaper.

The returns have been stunning — since the inception of an extranet-based trading system, called Global Link, customers have launched more than \$100 billion in trades, representing 15% to 20% of State Street's total trading volumes today.

Facing a maturing custody market where profit margins are razor-thin, State Street sought to expand its revenue base beyond its traditional role as a custodian of financial markets, said Marshall Carter, the firm's chairman and CEO. Fi-

nancial custodians keep the books for brokers.

One of the linchpins of State Street's strategy is Global Link, which runs over a high-speed network maintained by New York-based Bridge Information Systems Inc. It provides the money managers who are State Street's customers fast execution for foreign exchange, global equity and multicurrency trades.

Leg Up on Competition

Competitors such as The Chase Manhattan Corp. and Citigroup Inc. also offer online foreign exchange trading capa-

bilities to customers. However, their systems aren't as robust and lack features such as the ability to lock in real-time prices that Global Link's FX Connect component offers, according to Maitland Lammert, an analyst at Edward D. Jones & Co. in St. Louis.

Global Link's foreign exchange component "is truly unique" because it streamlines trade processing electronically, reduces operating costs and minimizes transaction failures via real-time trade execution, said James R. Hiatrides, director of investment operations and technology at Scudder Kemper Investments Inc., a State Street customer in New York.

Because money managers typically shop around to see

which brokers offer the best pricing on foreign exchange, State Street plans to open up Global Link by the end of the year to competitors such as Chase.

"My [foreign exchange] trading team thought I was nuts" to open up Global Link to the competition, "but the buyers have the power, and we need these partnerships," said Stan Shelton, executive vice president and head of State

Street's Global Treasury Division. And opening Global Link to competitors is a good strategy because it will increase the amount of all types of trades coming into the system and will likely increase the amount of custody business State Street gets from banks, said Larry Tabb, an analyst at Needham, Mass.-based The Tower Group.

So far, State Street has invested "well south of \$3 million" in software development to create Global Link, which runs on a set of Sun Microsystems Inc. Unix servers powered by a Sybase Inc. database engine, Shelton said. ▀

EBay Tops in Auction Niche

Analyst ranking gives high grades for customer service; more support planned

BY CAROL SLIWA

EBay Inc. — ranked tops overall in a recent Internet auction site survey — plans to ramp up customer service still further, even scanning its base of gung-ho users for potential candidates to fill the new jobs.

The San Jose-based company last week announced plans to add a second support center in the Western U.S. that will double the size of its customer service organization, said Matthew Bannick, eBay's vice president of customer support.

The company currently has a customer support center in San Jose that employs 160 people. Another 80 remote representatives are spread over two dozen or so states. Some of the remote workers were recruited from eBay's community bulletin boards.

"We saw people who'd done a lot of posting and demonstrated a clear knowledge of the site, and we'd recruit those individuals" for customer support jobs, Bannick said. "We like active eBay users [who have] empathy and dedication to the community."

Nearly 95% of eBay's customer support is conducted via e-mail, so eBay employees must have highly developed writing skills, Bannick said. The system is e-mail-centric because most users have only one telephone line at home and wouldn't be able to look at

the site and use the phone at the same time.

Gomez Advisors Inc. in Concord, Mass., last month ranked eBay first overall among the top 15 Internet auction sites, based on its direct examination of the sites, questionnaires and phone interviews. Criteria included ease of use, customer confidence, on-site resources and relationship services.

EBay ranked first in on-site resources and relationship services and second in ease of use and customer confidence (see chart). "Really no one has been able to touch them so far," said Sue Rothberg, a Gomez senior analyst. ▀



STATE STREET'S STAN SHELTON plans to open up Global Link to competitors by the end of the year in order to partner with buyers

E-Billing Bug Hits 21 Banks

Now fixed, software glitch kept users of CheckFree off-line

BY KATHLEEN OHLSON

An intermittent computer problem caused major service disruptions for almost a week to CheckFree Holdings Corp.'s electronic bill and payment service, affecting customers of 21 banks using the service.

The glitch affected "a fraction" of the customers — approximately 400,000 — who use Intuit Inc.'s Quicken or Microsoft Corp.'s Money Personal Financial Management software, said Gustavo Machado, a spokesman for CheckFree. Customers are often either being timed out or not connecting at all, Machado said. First Union Corp. and Wells Fargo Bank are among the banks being affected, he added.

The company first became aware of problems caused by the glitch April 26 and resolved it April 30. Technicians lost some time locating the glitch, looking at the configuration or capacity in its new billing transaction platform called Genesis, said Laurinda Wilson, spokeswoman for CheckFree. It was discovered that the high-volume transaction processing software had a bug, causing a blockage in the service when volume peaked, Wilson said.

The company didn't offer more details on what caused the migration difficulties. ▀

Highest Bidders

Top Internet auction sites

SITE	SCORE*
eBay	7.95
Onsale	6.97
Auction Universe	6.56
DealDeal	6.31
FirstAuction	5.89

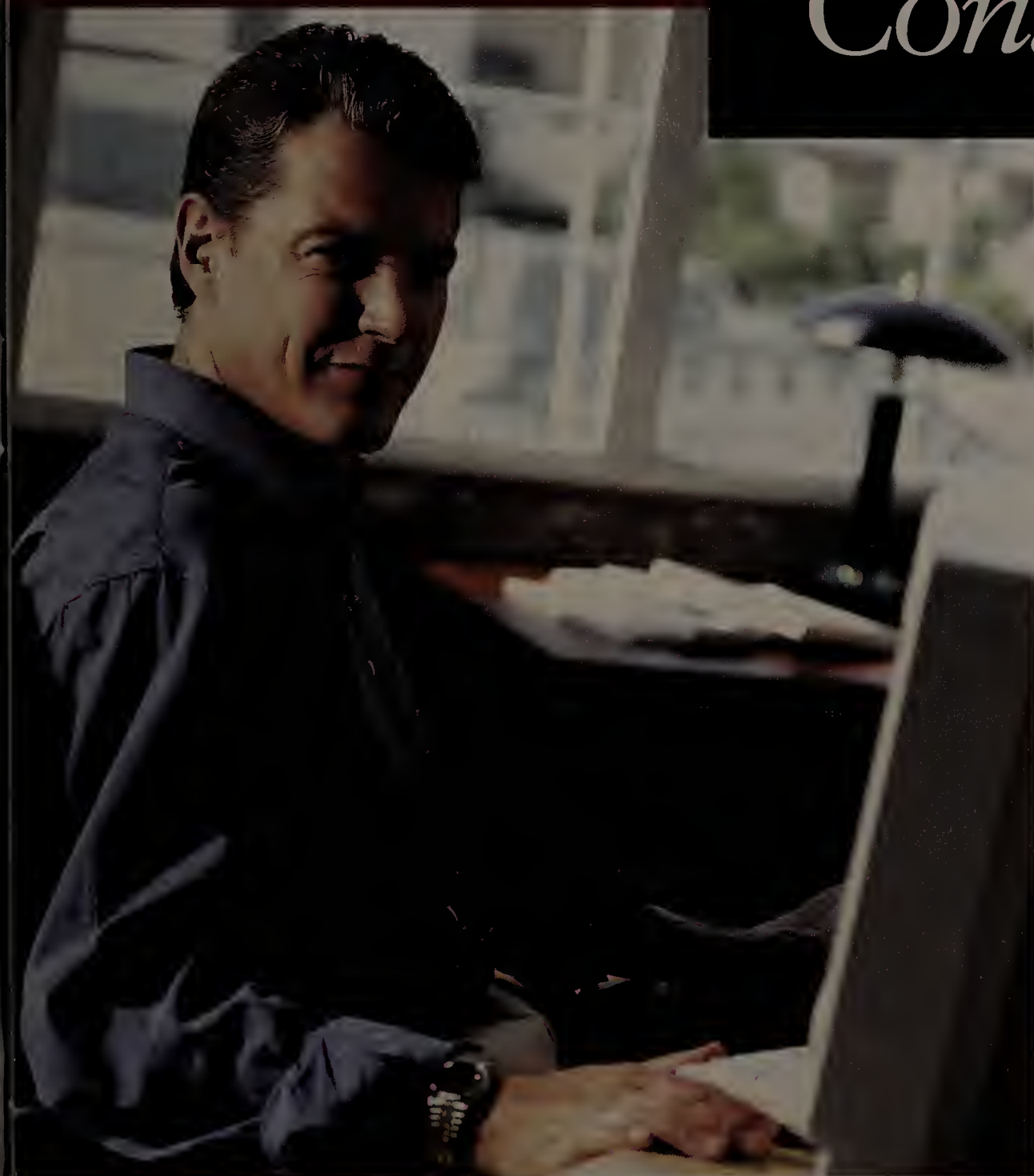
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Customer confidence	DealDeal
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BUNDLED APPLICATIONS STYMIE YEAR 2000 PATCHES

Databases and other noncompliant systems thwart commercial fixes

BY THOMAS HOFFMAN

AS USERS dive into their year 2000 testing, some are finding that even patched software won't work if it relies on integrated databases or software utilities that haven't been fixed.

For example, a vendor may provide a Y2K patch to an accounts-payable package, but testing may reveal that the software won't function properly because the database it's bundled with isn't year 2000-ready.

Integration Is the Problem

The problem affects software applications that are sold as a bundle as well as programs that users have integrated. Because so many software packages these days are tightly integrated, the year 2000 contamination effect has become "fairly widespread, and the solution isn't apparent," said Andy Bachman, an analyst at Aberdeen Group Inc. in Boston.

The American Red Cross faced the problem and came up with its own relief. The Red Cross uses Citrix Systems Inc.'s WinFrame/Enterprise system to run 16-bit Windows NT 3.51 financial applications.

After installing a Y2K patch for WinFrame, the disaster relief agency quickly discovered that it couldn't load a general ledger package from Oracle Corp. called Oracle GLDI 3, said Richard Brook, a year 2000 test manager at the Red Cross in Falls Church, Va.

Back to Square One

To make the system work, Brook and his team reinstalled the noncompliant version of WinFrame, reloaded Oracle GLDI and then upgraded to the Y2K-ready version of WinFrame. So far, the approach seems to have worked, Brook said.

A Y2K project director at an East Coast bank said his company ran into similar problems when it received a Y2K patch for a decision-support package. Although the software itself was tested to be year 2000-ready, a report writing tool from a separate vendor that's bundled into the package still doesn't work, said the user, who requested anonymity.

The bundling problem isn't limited to off-the-shelf applications. The core software en-

gines that generate reusable components might be year 2000-ready, but embedded software routines from other vendors might not be, noted Capers Jones, chief scientist at Artemis Management Systems Inc. in Burlington, Mass.

For its part, Microsoft Corp. promises to make year 2000 fixes available to any of its NT-based applications as long as users upgrade to NT 4.0 Service Pack 4, said Don Jones, a year 2000 product manager at Microsoft.

If another vendor's software isn't year 2000-ready, Microsoft will "support them as far as we can," but the company strongly recommends that customers complete their own integration testing, Jones said. ▀

Breaking Through Bundling Issues

Ways to help resolve year 2000 problems between compliant and noncompliant bundled software applications:

- Study your software contracts thoroughly. Check for language indicating that a software supplier or external vendor might be responsible for the year 2000 readiness of an entire package or subset of operations.
- Call vendors or software resellers directly to see if they can resolve the problems themselves or offer any support services.
- Regard vendor compliance status as a guideline. From a legal standpoint, you may not be able to hold a vendor to the year 2000-readiness of a product or service.
- If a vendor is difficult to reach or has gone out of business, try to make software fixes yourself (assuming you're not missing needed source code).
- Be prepared to find alternate vendors/software packages.
- Test, test, test.

SOURCE: USER AND ANALYST INTERVIEWS

Some Downplay Chance of Glitches in July

Users, analysts see fewer repercussions in fiscal year than Jan. 1

BY STACY COLLETT

Despite reports of pending year 2000 problems at the height of summer, Y2K analysts and project leaders say only a small number of companies will experience problems beginning in July.

One market research firm reported that year 2000 failures will begin in phases, with the first occurring in July as some companies enter their new fiscal year.

Overall, only 8% to 10% of year 2000-related breakdowns will occur during the end of December and the beginning of January, according to Lou Marcoccio, an analyst at Gartner Group Inc. in Stamford, Conn.

But statistics show that just 6% of the 18,017 corporations worldwide have fiscal years that end June 30, according to Worldscope, a database used by mutual-fund managers to track corporations.

And even with the fiscal year challenge, only one-third of applications needing Y2K repairs contain financial data,

I don't see any significance to an end-of-June [deadline] here.

**ELMER GLAU,
Y2K ADMINISTRATOR,
DUNLOP TIRE CO., AMHERST, N.Y.**

said Capers Jones, chief scientist at Artemis Management Systems Inc. in Burlington, Mass. Jones said the likelihood of Y2K glitches at year's end is closer to 70%.

Gartner's Marcoccio was unavailable for comment.

3M Co. operates on a calendar-year basis. But Bob Friz, 3M's Y2K project leader in Austin, Texas, foresees a higher probability of year 2000 problems in January than in July for any company.

"It's not just accounting software we're looking at ... but heating and cooling systems, manufacturing processes and security systems," Friz said. "The likelihood of failures is 50-50 between intelligent devices vs. software."

Not Worried

"I don't see any significance to an end-of-June [deadline] here," said Elmer Glau, Y2K administrator at Dunlop Tire Co. in Amherst, N.Y. "Our project is scheduled to be completed by the end of the third quarter."

Even for corporations with many year 2000 deadlines, July will be just one of many critical milestones. "So many of our systems are operating in a Y2K environment already," said Kurt Ebenhoch, a spokesman for United Air Lines Inc. in Fort Worth, Texas. United's reservation system began to operate in the Y2K environment on Feb. 4 without incident, Ebenhoch said. "For us, it's been not one day, but 100 days," he said. ▀

SNAPSHOT

Competitor Comparison

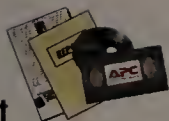
How the top two U.S. makers of building materials are doing on their year 2000 work:

	OWENS-ILLINOIS	OWENS-CORNING
Fortune 500 rank	302	319
Costs through 1998	\$24M	\$145M
Overall estimate of year 2000 work	\$50M	\$170M to \$175M
Notes	Expects to have critical IT and non-IT systems compliant by September	Expects to have updated or replaced all systems by end of June

SOURCE: COMPANIES' 10-K FILINGS IN MARCH WITH THE SECURITIES AND EXCHANGE COMMISSION

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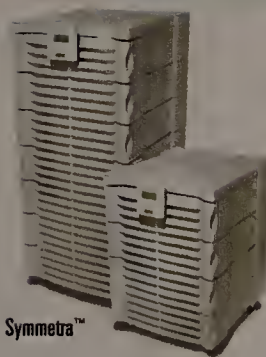
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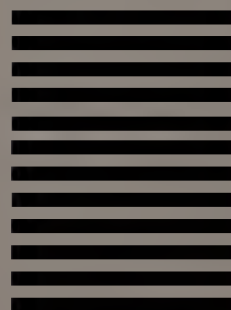
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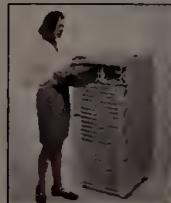
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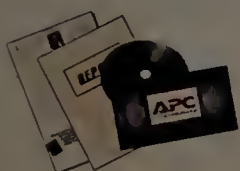
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LEASING CUTS PC COSTS 30% AT DOW

Firm rips out 14 platforms in standardization

BY JAIKUMAR VIJAYAN

LEASING PCs has proved a good way for Dow Chemical Corp. to standardize its vast desktop technology base and reduce ownership costs.

During the past three years, the company has moved from more than 14 different desktop platforms — including mainframe access terminals, proprietary workstations and PCs from many vendors — to two standard desktop and notebook models from IBM.

In the process, the company has replaced six different

e-mail systems with Microsoft Corp.'s Exchange and has standardized on 125 desktop applications for various functions.

The moves have reduced desktop costs by 30%, prompting Dow in February to renew

a three-year lease agreement with IBM for \$90 million, said Kevin McCarron, manager of lease fulfillment at Dow's Midland, Mich., headquarters.

McCarron wouldn't put a dollar amount on the savings but said most of it came from the centralized management and lighter product support re-

quired in a homogeneous desktop environment.

"We had quite a variety of desktop systems being purchased by different departments before. It was very inefficient and expensive for us to maintain it," McCarron said.

Leasing also has given Dow a way to spread desktop costs over three years and an easy way to dispose of systems at the end of the period, said Ben Brock, a workstation asset manager at Dow.

"We get to use the best part of an asset and return it to the lessor in the end," Brock said.

upgrade as needed by buying out the lease on the hardware being replaced. Building an upgrade clause into a lease deal tends to steeply drive up costs, McCarron said.

■ Keep hardware choices simple — and know what users want. Dow users have a choice between an IBM desktop and a notebook. Each system comes loaded with a core set of applications like Microsoft Office, security tools and mainframe access software, in addition to software needed by an individual user.

■ Make sure the operating lease is negotiated so that the hardware retains some value when it's returned to the lessor at the end of the lease. That should encourage the lessor to offer slightly better terms.

■ Be prepared to negotiate separate leases in different countries to account for local laws and to purchase rather than lease when appropriate. ▀

Loving Leasing

How PC leasing has helped Dow:

ALLOWED THE COMPANY to standardize PCs globally

IMPROVED PC inventory controls

REDUCED PC management costs

REDUCED DESKTOP support and operational costs

Leasing Lessons

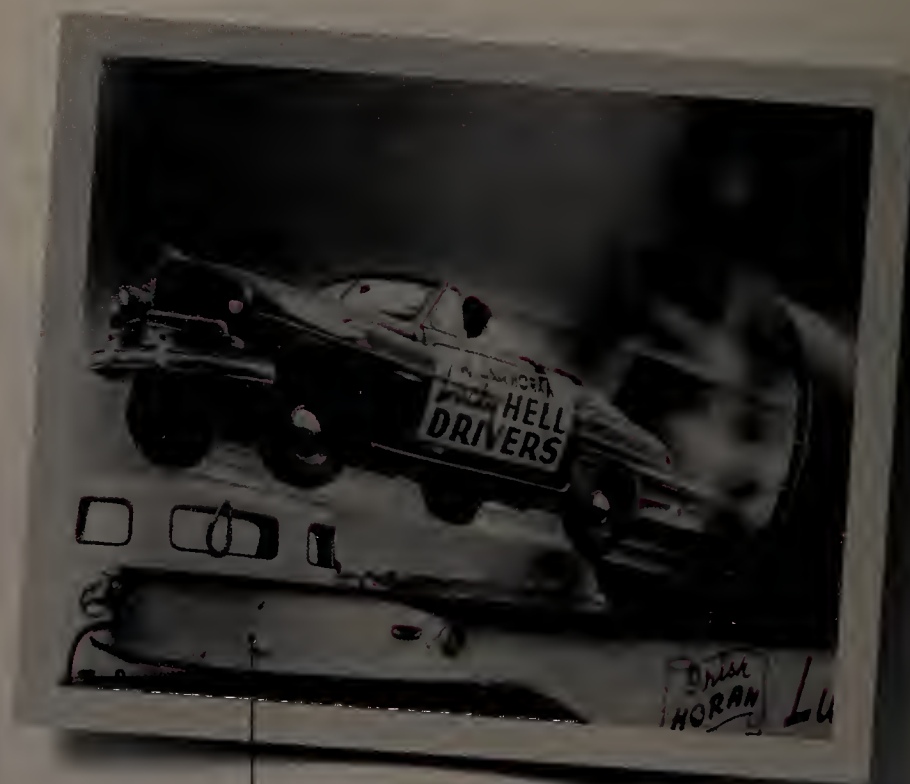
Because of its success with the first lease, Dow retained most of the same terms and conditions the second time around. Among the lessons learned from Dow's first go-around with PC leasing are the following:

■ It's more cost-effective to

great moments in disaster prevention



1912 The first successful parachute jump.



1964 Seat belts become standard equipment.

Bank's Phone Backup System Speeds Customer Service

Extra machine cuts call wait time, costs

BY BARB COLE-GOMOLSKI

In its ongoing efforts to outdo the competition in customer service, First Union Corp. has developed a backup voice response system to handle overflow calls when its primary, mainframe-based system is bogged down.

The bank, which has acquired several financial services companies in the past few years, found that at peak times, its voice response system buckled from high volume. Then, or when there was an outage, callers were routed to live operators, which cost

the bank \$3 instead of 30 cents per call.

The backup system has helped First Union keep the voice response application up 100% of the time and wait times short by taking over for the main system if it can't handle the call in 10 seconds, according to Oleh Procinsky, senior vice president of information technology at the Charlotte, N.C.-based bank. The application will soon provide a backup for the online banking system as well, he said.

"Our ultimate goal is to allow customers to interact with us [via telephone or the Web], switch at will and not lose context," Procinsky said.

If First Union can do that, it will lead most of its competi-

tors in presenting a unified customer service face to clients, said David Baltaxe, an analyst at Current Analysis Inc. in Sterling, Va.

First Union declined to say how much it spent building the application, which involved buying a midrange system, a database, middleware and significant custom development.

The system works by taking the database transactional information for customers who used the voice response system during the past 35 days and storing it in an Oracle Corp. database. Those customers' subsequent calls then can be routed to the backup system when needed. Calls from customers whose information wasn't recently accessed are still routed to operators.

The backup system has proved its mettle, handling around 50,000 calls per day. In total, the bank handles as many as 20 million calls per month

via the voice response system.

On the downside, the information in the backup system is typically several hours old.

"There are slowdowns every

day, but this application is especially useful for the rare, big-time outage," Procinsky said. "It stops a flood of calls from coming into the [call] center." ▀



FIRST UNION'S OLEH PROCINSKY

"Our ultimate goal is to allow customers to interact with us [via telephone or the Web], switch at will and not lose context"

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Microsoft Judgment Could Cost IT Big Bucks

BY PATRICK THIBODEAU
WASHINGTON

As the antitrust trial of Microsoft Corp. heads toward its final phase, antitrust experts and industry groups are scrambling to suggest remedies that will address the court's concerns and help consumers.

If the government prevails, trial Judge Thomas Penfield Jackson will ask for recommendations from prosecutors about what restrictions to impose on or changes to require of Microsoft.

Some observers fear that the wrong remedies will produce higher software prices and less interoperability. Others say certain punishments may improve operating system performance and user choice.

"If you don't get the remedy right, then [the government's antitrust case] is just worthless," said Joseph Simmons, a partner at the Washington law firm of Rogers & Wells LLP. A bad or too-weak remedy may only "embolden" Microsoft, he said.

If it wins, the company will be free to continue bundling software into its operating system — potentially killing emerging markets and stifling competition, experts said.

Break It Up

One outside observer, Don Stroud, the MIS director at Plain Dealer Publishing Co. in Cleveland, favors a strong approach. If Microsoft is found at fault, he said, he would like to see the company broken up along its operating system and application lines. Such a move would help foster competition, he said. It would also force Microsoft to ensure that third-party software developers have the interfaces they need to write for the Windows operating system, Stroud said.

But there are warnings that some remedies could be costly for users.

The Association for Competitive Technology (ACT), a software developer trade group that has supported Microsoft's position, said that requiring multiple versions of Windows would increase developer costs by as much as \$30 billion per year. That claim is based on a study by University of Texas economics professor Stan Liebowitz that pre-

dicted research, marketing and support costs would cause most of the increase.

Others argue that the bene-

fits of more competition would offset added porting costs. Remedies that allow developers to license parts of the Win-

dows operating system might lead to "hybrid" operating systems that combine, for instance, the best features of Linux and Windows, said Frederic Scherer, a professor of public policy and corporate manage-

ment at Harvard University.

Even if Microsoft wins its court case, "There will be a major political drive to change the domination of Microsoft," predicted consumer advocate Ralph Nader. ▀

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Luxury Travel CIO Ready for Online Voyage

Imagine joining a start-up luxury travel service bent on acquiring a string of tour providers with plans to build

an online presence for affluent travelers. That's what **Dick Smith** is doing. The former CIO at Minneapolis-based Carlson

Wagonlit Travel and Holiday Inn Worldwide in Atlanta became executive vice president and CIO at Luxury Travel Co.

in Boca Raton, Fla., in late March. Smith, 59, who brings with him 38 years of information technology and business experience, spoke with *Computerworld* senior editor Thomas Hoffman in Atlanta.

Q: What have you been doing so far? Do you have an IT staff?

A: I've been spending most of my time with the other senior executives courting the other companies that we're acquiring. We have no IS staff to speak of. That will be one of the next things I do. But I intend to outsource many of the functions of the company. For example, we're going to go heavy into Web and intranet development, so we'll look for companies to help us with that.

Q&A

The [tour provider] companies we're acquiring [to be announced by late this month] will have small IT staffs. I'll probably hire and use contract resources that would total no more than 12 to 15 people over the next six months.

Q: What kind of online strategy are you planning?

A: We want to create a multiplicity of online applications ... like online booking ... to put a global umbrella on the companies we're acquiring and to re-establish their brand name and ours. More of our content will go onto the Net and not into brochures, which can be expensive and go obsolete pretty quickly.

Q: How much will you spend on IT?

A: We'll spend roughly \$10 million to \$20 million on these initiatives over the next two to three years.

Q: What do these initiatives include?

A: In addition to Internet and intranet development, we've also got to clean up and improve financial control systems and systems that measure the quality and service for



SMITH: Will put booking applications on the Web, not on brochures

the travelers we're accommodating to find out how well we're performing in their eyes.

Another major initiative to support cross-selling is to have a very sophisticated data warehouse and data mining capabilities. We'll look hard at [Menlo Park, Calif.-based] Informatica [Corp.] tools and Oracle [Corp.] for a database, given Carlson's experience there. ▀

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A MATTER OF DEGREES

With recent college hires, no matter which IT discipline they studied, managers can expect substantial training challenges

BY FAWN FITTER

IT'S DIFFICULT to assess an entry-level job applicant's qualifications by simply looking at his résumé. Fresh college graduates probably lack the real-world experience and proven track record you'd use to evaluate a candidate with more years in the information technology business. That puts the applicant's education in the spotlight.

Chances are good you'll see one of the following three degrees on an entry-level candidate's résumé:

■ **A bachelor's degree in computer science** tends to be heavily technical, focusing on the science of computing. Candidates with this degree have spent a lot of time studying programming languages, data structures and hardware.

■ **A bachelor's degree in MIS** focuses more on how technology is used in business. Candidates with this degree have studied business, strategy, analysis and a certain amount of hard programming.

■ **An associate's degree in computers or technology** from a two-year college, adult education program or trade school focuses on one or two common programming languages, though probably not in depth.

Obviously, each of those degrees is the end result of a fairly distinct course of study, but hiring managers say that no one degree is more valuable than another.

In fact, entry-level applicants from various academic backgrounds are more alike than different: They all still require further training in both general industry norms and employer-specific skills.

"The reality is that when students come out of school, they still have a lot to learn, and they need to be molded into what the company needs," says Robin Stenzel, manager of staffing and training and development at Delta Technology Inc., the IT subsidiary of Atlanta-based Delta Air Lines. "If they have a [computer science]

We don't pigeonhole people because of their degree.

KAREN PRICE,
CAPITOL ONE BANK

or MIS degree [and] they have the proper aptitude — we take it from there."

It's true that the stereotypes attached to each degree — computer science majors code machines and MIS grads can't see the details for the big picture — are based to some extent in fact.

For example, computer science students tend to be better equipped for jobs requiring them to know the finer points of C++ programming, and MIS students tend to make better analysts than Java jockeys.

Personality

But a degree may not be the best determinant of what a prospective hire has to offer. Aptitude tests, professor recommendations and references from summer jobs and internships can be useful in teasing out the truth. What's vital, be-

yond technical aptitude, is that candidates demonstrate the ability to learn new skills — business as well as computing — and apply them appropriately in the workplace.

Delta Technology, for example, recently started a college recruitment program to bring in 25 new graduates each year from both MIS and computer science backgrounds.

The decision to recruit candidates is based on their skill, not on the degree they've earned, Stenzel notes. "We want entry-level candidates to have some kind of programming skills, maybe a bit of engineering, but either curriculum matches up with what we're looking for," she says.

At Rite Aid Corp., the Fortune 500 pharmacy giant, information services recruiter Michele Krebs is looking primarily for programming and logical problem-solving skills. Krebs says that although she sometimes finds people with MIS degrees aren't as technically proficient as their computer science peers, she hires both MIS and computer science people as entry-level systems engineers as long as they can pass a programming aptitude test.

"Even as people evolve into

doing less and less coding, understanding logical skills and how the computer is doing everything is key," she says. "[You can't] have people who only do analysis and don't understand what makes it go."

Capital One Bank in Falls Church, Va., one of the world's largest credit-card issuers, with 16.7 million customers, takes the opposite tack. IT recruiting manager Karen Price says IT is so tightly integrated with business there that her ideal entry-level candidates have enough business knowledge to understand what end users want and the technical savvy to be able to translate that into programming.

"Can you get that with an MIS degree? Absolutely. Can you get it with a [computer science] degree? Very likely," Price says. "We don't pigeonhole people because of their degree. MIS people are more integrated from a business sense, and [computer science] has more of a technical aspect, [but]... if a manager is looking just at a degree, he's overlooking a lot of great candidates."

The only time IT hiring managers balk is when faced with someone with a two-year degree. Price says she'll consider applicants with two-year degrees for entry-level positions if they've taken business as well as technical courses.

But Stenzel says applicants with associate's

The Value Of IT Degrees

ASSOCIATE DEGREE IN COMPUTERS OR TECHNOLOGY (2 YEARS)

PROS: Focuses on specific languages or skills. Constant stream of new graduates

CONS: Curriculum doesn't necessarily teach critical problem-solving or go into sufficient detail. Quality of training highly variable

COMPUTER SCIENCE DEGREE (4 YEARS)

PROS: Highly technical; offers much experience and understanding of programming

CONS: Candidates may lack soft skills in teamwork, communication and analysis. Curriculum may focus on emerging technologies at the expense of classic skills such as Cobol

MIS DEGREE (4 YEARS)

PROS: Combines technical and business skills. Management potential

CONS: Candidates may lack programming skills and inadequately understand hard technical issues

degrees or certificates won't find a place at Delta Technology unless they also have several years of practical work experience.

Krebs says she considers candidates with associate's degrees only if she's familiar with the school's platform and curriculum. ▀

Fitter is a freelance writer in Brighton, Mass.



ERIC HANSON

Er.H

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LEGAL BRIEFS

State Sues AMS

The Mississippi State Tax Commission filed a lawsuit against American Management Systems Inc. (AMS) 10 days before the Fairfax, Va.-based systems integrator was scheduled to launch a key component of an automated tax revenue system it began building in late 1993.

Alleging that AMS failed to deliver software as described in the contract, the state is seeking \$985 million in damages. The contract is valued at \$11.2 million.

AMS said the state's complaint is without merit.

Hospitals File Suit

Three Iowa hospitals have filed a class-action complaint against Boston-based systems integrator Keane Inc., charging that their MedNet medical billing and electronic claims filing system isn't compliant for the year 2000 date rollover.

The complaint, filed in U.S. District Court for the Northern District of Iowa by Mineral Area Osteopathic Hospital and two other medical facilities, asserts that the hospitals spent more than \$300,000 on systems sold by Iowa-based Source Data Systems, which Keane acquired in 1995.

The complaint includes breach of warranty, breach of contract and an injunction forcing Keane to make the systems year 2000-ready.

Top Wired Countries

As of Jan. 1, 1999:

NO. OF WEB USERS	
U.S.	76.5M
Japan	9.75M
U.K.	8.1M
Germany	7.14M
Canada	6.49M

SOURCE: COMPUTER INDUSTRY ALMANAC INC.

NEW REPORTS

Thin-Client Market On Upswing

Increasingly powerful servers and robust networks are leading to a proliferation of thin-client information access devices, reports Redwood City, Calif.-based Zona Research Inc. (See related story, page 69.)

In its report, "The Thin-Client Market - 1999 and Beyond," Zona predicts that growth of the worldwide thin-client market will surpass 2.25 million units by 2001, with revenue exceeding \$1 billion. It attributes the projected growth to Microsoft Corp.'s 1998 release of Terminal Server Edition, which allows users to deploy centralized Windows applications using a Microsoft-endorsed thin-client product.

The report, which also provides vendor market share estimates, costs \$495. www.zonaresearch.com

Online Auctions Key to New Sites

Online auctions are becoming a critical component of e-commerce sites, according to International Data Corp. (IDC) in Framingham, Mass.

In a new bulletin titled "Online Auctions: The New E-Commerce Enabler," IDC asserts that online auctions aren't a passing fad because they offer the three critical "Cs" for sustained success on the Web: community, content and commerce. Additionally, they can reach a global customer base, handle large quantities of data and support an infinite number of products and services.

The bulletin profiles leading online auction houses and examines competitive factors, niche auction sites and auction software. (See related story, page 38.)

The bulletin costs \$1,750. www.idc.com

PETER G. W. KEEN

Stop the forecasts!

FLIP OPEN almost any magazine in the IT field and you'll find a graph or bar chart forecasting the growth of the electronic-commerce market. I have my own prediction to make: If you file it away and look at it five years later, it will be hopelessly, ridiculously wrong. Remember videotext? Back in 1983, a leading research firm confidently forecast that consumer sales of videotext would be \$7 billion by 1987. The actual figure was less than 10% of that.

Forecasters regularly come out with wildly different numbers for the same thing. The National Sales Federation's prediction for online consumer sales for the 1998 holiday season was \$174 billion. Jupiter Communications' estimate was \$2.3 billion.

Forecasters can't even agree on what's already happened: In 1997, Forrester Research and International Data Corp. came out with different numbers on the size of the 1996 e-commerce market, reporting \$9.5 billion and \$5.4 billion, respectively.

The forecasters are neither fools nor charlatans. But there is so much effort, so many statistics, so many trees dying in vain to waft this ephemera across newsstands! Why not accept the obvious, which is that no one can predict the growth of e-commerce?

Instead, turn IT planning into a series of gambles, uncertainties and assumption-testing.

The challenge, then, is how to plan when you can't predict. To do that, don't ask what the future will be. Instead, ask how different the future needs to be from today before it disrupts our business model and requires us to move aggressively. Then make a judgment call about how likely that future state will be.

For instance, what percentage of your industry's or company's customer base or operating margin can it afford to lose before it becomes unprofitable? In retailing, it's clear that if a mall loses 10% of its customers for good, it will have to close. My own approximations are that a permanent margin cut of around 15% would turn the standard business vision into a signpost for Chapter 11.

How likely is that within the next three to five years? In petrochemicals and pharmaceuticals, not very likely. In securities trading, car dealerships, travel agents, distribution and bookselling, it's happening now. Banking? It's not yet clear, but if a quarter of all securities

trades are now online, banking is likely to be at the 10% level within the next three years. That 10% is still a small fraction of the total, just as today's online retailing percentage is tiny. But 10% changes the basics of business. You don't need the grandiose, \$1-billion-now-and-\$1-trillion-soon forecasts. Look only at the window of vulnerability for an industry and company.

Of course, there are many areas in which IT has to place bets now on specific technologies and vendors. But the forecasts have historically turned out time and again — and again and again — to be worthless. They suffer from the

linear fallacy that the future is a straight line or a steep curve from the past, that business dynamics are deterministic and hence can be extrapolated. Show me the extrapolations of 1990 that anticipated the competitive companies of today: Cisco, Qwest, Lucent, Netscape, AOL, Yahoo, Nokia, Ariba and Exodus.

Smart companies make smart bets. They substitute alertness for predictions. Smart IT organizations design their architectures to hedge the unpredictability of technology through their choice of standards and vendors and by building in scalability and the capability of integration. Sharp executives keep very good company in terms of the vendors they work with, the books and publications they read and the people to whom they listen. They are always testing and challenging their own assumptions. The more uncertain and unpredictable IT is in terms of technology, competition, applications

and customer response, the greater the opportunity for competitive advantage.

A final prediction: The market for predictions will grow 39.3% through 2000 — and collapse in 2001. ▀

Instead, ask how different the future needs to be from today.



Keen is co-editor of a newsletter called "YOU2K Now." For more information, visit his Web site at www.you2k.com. His Internet address is peter@peterkeen.com.



How often do
the phones crash?
(Still think your
datacom is reliable?)

When it comes to mission critical services, Ericsson has been developing and implementing carrier-class switching systems longer than anyone. It's this experience we're now bringing to bear on datacom – in the shape of a new high-performance ATM switch.

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Which all goes to explain why, when large carriers pick up the phone to order large ATM networks, they're now calling Ericsson.

EXTREME OUTSOURCING: DOES IT WORK?

Du Pont and General Dynamics say their big outsourcing deals have been big successes. But skeptics still argue that it's a dangerous practice. How can you make it work despite the odds?

By Alan S. Horowitz

WITH THE END of the Cold War and the subsequent consolidation of the defense industry, defense contractor General Dynamics Corp. knew it would have to rethink its business, including selling off business units. Such sales would be easier if IT was entirely outsourced, which prompted the Falls Church, Va.-based company in 1991 to take 2,500 IT employees and transfer them to Computer Sciences Corp. (CSC).

Ever since, it has continued to outsource almost all its information technology functions. Why does it maintain such large-scale outsourcing? "It really works," says Ken Hill, General Dynamics' vice president of IT.

Is General Dynamics' experience an anomaly? Does extreme outsourcing — defined as having at least 50% of IT functions outsourced — really work?

Unfortunately, there's little consensus among observers.

A study of 116 companies by college professors Mary C. Lacity and Leslie P.

Willcocks suggests extreme outsourcing usually doesn't work. Of the three outsourcing categories into which the study places companies, total outsourcing was the least successful. It succeeded at only 38% of the organizations that tried it, with 35% reporting failure, and 27% reporting mixed results.

When the opposite was studied — total in-house sourcing — the results differed markedly.

In-house sourcing succeeded 76% of the time, twice as often as total outsourcing, and failed 24%. The best results (by a small margin) came from those doing selective outsourcing, where 15% to 25% of the IT budget is under third-party management. It succeeded 77% of the time and failed 20%, with 3% reporting mixed results.

Lacity, associate professor of management information systems at the University of Missouri in St. Louis, attributes the poor showing of total outsourcing to the difficulty of predicting the future. "It's very hard for a company to know what it will need over the long haul," she says. "What they wanted in the first year can dramatically change

by year two." Having only one supplier can also be a showstopper. "The lack of competition [between suppliers] creates a lack of incentives to overperform," she says.

Lacity isn't the only skeptic. "We now know that extreme outsourcing is quite dangerous. Extreme anything can be dangerous," observes Eric Clemons, professor of operations and information management at the Wharton School in Philadelphia. Control, or lack thereof, is really Clemons' concern: "You lose day-to-day control, even the ability to get a good contract later. The more extreme your outsourcing, the less information you have for really specifying anything."

Stephen McClellan, a San Francisco-based computer services industry analyst at Merrill Lynch & Co., notes another risk: "You're locking yourself in with a vendor indefinitely, usually 10 years. It's even more of a locked-in arrangement than getting married. It's a bit of a one-way street."

Sometimes, the issue is more a matter of perception. "What is considered a success for one company is a failure for



DU PONT CIO Robert R. Ridout, on his company's decision in 1997 to outsource 75% of its IT people: "One of the things that really impresses me is [that] the work's getting done"

Careworks of Ohio Ltd., a Dublin-based managed care organization founded less than three years ago, outsources half its IT functions to Medical Mutual of Ohio. Its goal: to get up and running faster to take advantage of market opportunities. "We were a start-up company entering a large market with a large volume of bills that had to be processed, and for us to do all the programming ourselves would have taken a significant amount of time and resources," notes the company's chief operating officer, Rich Poach.

Dan Mummery, a partner in the global technology transactions group at the New York law firm Milbank, Tweed, Hadley & McCloy, says evidence that extreme outsourcing works is simple — people keep doing it.

Making Extreme Outsourcing Successful

Companies that have enjoyed success with extreme outsourcing have taken steps that helped assure a desirable outcome. Poach says defining up front what will be provided and when and how it will be provided is essential.

Also, establish specific metrics. "Define, 'Here's what I'm buying, here's how I measure results,'" recommends Peter Bendor-Samuel, president of the consulting and software company Everest Group in Dallas. Performance metrics to consider include things such as processing speed, volumes and time lines for implementation.

Some functions tend to be more successfully outsourced than others. Goldman says outsourcers are good with day-to-day repetitive tasks, but not with implementing bleeding-edge technology. Those who are successful "focused on infrastructure, which is 80% of [an] IT operating budget," Lacity says. "Infrastructure is a lot easier to outsource than application development."

"You have to have common goals. If [the customer's] goal is to reduce head count or lower overhead, I can't have goals that are obstacles to that," says Mark Dieterle, vice president and account executive at CSC who handles the General Dynamics account.

Cynthia Murphy, senior analyst of outsourcing at IDC, gives the following recommendations for success:

- Do your homework ahead of time.
- Find the vendor that is the best fit for your company. Consider things such as track record; expertise; its record with companies your size and with companies in your industry; and whether its contracts have been renegotiated (find out why). Check out its employee turnover, too. You could get into trouble if you sign a 10-year contract, and

another. A third company might call it a working solution because no one wants to own up to the fact that it's not working," comments Stan Goldman, president and CEO of Technology and Business Integrators Inc., a strategic IT and management consulting company in Woodcliff Lake, N.J., which conducted a study of outsourcing in 1997 with International Data Corp. (IDC).

The Successful

But extreme IT outsourcing does have a few success stories.

In 1997, chemical giant Du Pont Co. outsourced 75% of its IT people to CSC and Boston-based Andersen Consulting. "One of the things that really impresses me is [that] the work's getting done," says Robert R. Ridout, CIO and vice president at Du Pont Information Systems. Previously, Du Pont had about 200 IT vacancies it couldn't fill. CSC and Andersen have been able to fill those jobs.

Du Pont also points to improved success in projects. It labels projects "red" (there's a problem), "yellow" (needs watching) and "green" (going well).

During the year before the outsourcing deals were made, 5% of projects were rated red, 23% were yellow and 72% were green. Today, 2% are red, 11% are yellow, and 87% are green.

Another improvement lies in the efficiency of Du Pont's transactions done via its SAP system. Though they've increased 50% during the life of the contracts, those transactions are being completed faster — 98% are being completed in less than a second, up from 88% before the contract was signed.

"And we use hardware a lot more effectively, so our operating costs went down about \$700,000," Ridout says.

Andy York, acting director of information systems at shipbuilder Bath Iron Works, a General Dynamics subsidiary in Bath, Maine, notes that since his company began outsourcing with CSC, desktop software and hardware deployment has improved about 33%, and cost savings have reached the company's expectations (though York wouldn't reveal what the savings are).

Bath has outsourced virtually all its IT functions; its staff has fallen from 140 all the way down to three.

the vendor's employees who worked with you on the contract all leave six months later.

"I get a fair amount of calls from other companies who have done sourcing, and their deals aren't going so well," Ridout notes. "I think, generally, the problem is they prefer not to be as involved in managing [the deals] as they need to be. It's a fine line. You have to have really good people to make sure that you're managing the right things. Mainly, you're talking about the 'what needs to be done' and not the 'how.'"

Extreme outsourcing makes the procedural problems more complicated, according to New York-based negotiation consultant Elizabeth Gray, who has worked with Eastman Kodak Co. and other companies on their IT outsourcing arrangements. The more complex a deal, the more attention you must pay to the working relationship with the outsourcer and to managing that relationship, she notes.

Finally, create a win-win-win situation. Joe Randazzo, a senior director responsible for vendor management at a major Wall Street firm, says each outsourcing deal really has three parties: the company that's outsourcing, its employees who will be changing employers and the vendor. They all have to win for the deal to work.

Extreme outsourcing often doesn't work. If you decide to take this path, be certain you know what you want to accomplish and why, and how you plan to get there. ▀

Horowitz is a freelance writer in Salt Lake City. Contact him at alan@ahorowitz.com.

Needed for Outsourcing: Realistic Expectations

Dan Mummery, a partner at the New York law firm of Milbank, Tweed, Hadley & McCloy, says IT people's expectations about outsourcing deals often don't jibe with reality. Sometimes, the deals fail to meet expectations, and sometimes, they exceed it.

Where expectations are frequently not met:

- Cost savings
- Implementing a new solution

Where expectations are frequently met:

- Managing costs
- Vendor accountability

Where expectations are frequently exceeded:

- Access to a bigger pool of skilled workers
- Integrating systems across platforms throughout a company
- Employees who get transferred to an outsourcer often end up better off

— Alan S. Horowitz

KATHLEEN MELYMUKA/MS. MIS

Mom's the word

COULD IT BE that in our attempts to measure women's success in IT we've been looking at the wrong things?

An e-mail I received shortly before Mother's Day made me wonder. "Debbie," an IT specialist and single mom, took exception to my using the percentage of female IT executives to indicate their relative success in the field. "How many of those [women] want to make it to the top?" she asks. "[There are] women in technology who don't want to be CIOs but are happy with the technical positions we have, and we do not feel we are failures in any way."

I didn't mean to imply that they were failures, but I had assumed that those not at the top were at least heading in that direction.

Not Debbie. "I love my job, but my priorities were raising my son successfully and having time to participate in hobbies and outside activities," she writes unapologetically.

Debbie explains that IT is a great career for women because it offers more flexibility than most other careers. "If I ever needed time off to take care of my son or attend to other personal business, no one ever questioned it," she says.

Even better, she says, "it has allowed me to have an interesting, successful and well-paying career without having to go into management, which

I have never, ever been interested in."

Having spent 13 years as a freelancer on the mommy track and never harboring an ambition to manage anyone outside my house, I found Debbie's comments compelling. I asked around to see whether others felt this Mommy Factor might be skewing our view of women in IT.

"I could have written that letter," e-mails "Shelly," a software engineer who says IT work gives her more flexibility to spend time with her family.

"Sandra" reminded me that the Mommy Factor isn't just about children. "For me, it's simply a matter of balance," she says. "My position allows me the flexibility I want. I have no problem leaving work at 5 o'clock. My attention is

freed to concentrate on the other parts of my life."

But "Michelle," a young, unmarried process engineer, suggested that the Mommy Factor provides an easy out for women who can't cut the mustard. "The statement sounds like another excuse," she says. "If we tell ourselves we cannot make it to the top because of family or whatever, we will not get there."

"Phil," a male technical consultant, says some women use the Mommy Factor to mask inertia. "I don't think there is anything wrong with being content to stay in a middle-level job because of personal or family reasons," he says, but "I don't see as many women with the willingness to risk much to break into a new area."

I thought Phil's description sounded dangerously close to the definition of "deadwood." So did Sarah Banda Purvis, a consultant and author who focuses on workplace issues (www.insiderviews.com). She says that if the current, rosy IT employment picture ever deteriorates, the Mommy sector may as well wear a "Dump me first" sign. "The dynamics of our business sector provide little security for workers who do not demonstrate a willingness to accept more responsibility (e.g., become a team leader or manager)," she says.

But, mommies counter, why run the rat race if you really don't want the prize? "The last thing I'd ever want to do is be a CIO," says "Lydia," a systems programmer.

She notes that she tried management and didn't like it. "As a technical person, you can do your tech thing, and sometimes you can trouble-shoot from home," she says. "Management is a whole other ball game."

As for using the percentage of women executives to judge women's success in IT: "That's baloney," she says. "If people want to have families, they

don't aspire to those positions. Life is too short."

And guess what? Some daddies are on the same wavelength.

"Some guys also have priorities," writes "Dan," an IT manager in a major public university. "I work in the lowest-paying sector [because] I get a challenging environment along with normal days and weeks."

"My son and my daughter are growing up so fast, and I value the time with them more than the 50%-plus pay in-

crease I could get by going into the private sector," he says.

All of this is not to say that women in IT management have made the wrong choice — just that management is a choice and not necessarily the chief indicator of success.

"Happiness is having the freedom to design

your life and your work according to where and how you can contribute the most," reasons Carolyn Leighton-Tal, founding executive director of Women in Technology International (www.witi.org).

And shouldn't happiness be a factor in how we measure success? ▀



KATHLEEN MELYMUKA is Computerworld's senior editor, management. Contact her at kathleen.melymuka@computerworld.com.

COOL CAREER SITES

Web Sources for Women in IT

Ada Lovelace, credited as the first computer programmer for her work with pioneer Charles Babbage in the 1830s, might be disappointed by Web sites for women in information technology.

Perhaps there's just something inherently wrong with the concept: Is a woman's year 2000 problem any different from a man's? Are the workplace barriers women in IT face any different from those faced by women in other professions? Still, the Web is all about catering to niche communities, and women in IT undoubtedly face unique issues that could generate sufficient content and interest online.

But whatever the reason, most sites claiming to be homes for women in IT fall short of being

usable resources. Either they're high on women and low on tech, or high on tech but lacking a female focus beyond artwork and graphics that brand the Web site as a woman's territory.

The most common sin: They're infrequently updated or abandoned altogether. Still, each effort is deserving of attention for its attempt to congregate high-tech women on the Web.

Women in Technology International

www.witi.org

Here's a wide-ranging site that made a valiant attempt at offering female IT professionals one-stop shopping for information and resources on

technology, career and personal issues. The content maintained its slant to its niche audience, but its relevance to the busy IT woman is questionable.

For example, does a site for female IT professionals need a "Well-Being Center?" What it needs is a threaded discussion area inspiring group debate; instead, it has a static online bulletin board of random postings without online replies. What it needs is a focused job bank of IT positions; instead, it lists positions for everything from account-

ing to transportation, with only a handful of IT jobs.

At this juncture, it's a moot point. Last month, much of the content was a year or more out of date, with only a few sections — including the events pages, chapter listings and a fine "Hall of Fame" — kept current.

Spiderwoman: Women Who Make the Web

www.spiderwoman.com

At first glance this site seems to have a lot to offer — an online haven for women Web designers. But it's

mediocre at best. The articles, other than being penned by women, have little to offer. And although the site aspires to be the de facto home page for women Web designers, the content is aimed at Web newcomers: "Marketing Goddesses: 10 Ways to Market Your Web Site" was last month's home page headline.

The site's efforts to create an online community are uneven. It sponsors two chat rooms. The postings at the site's online bulletin boards covering technology and gender issues are less than provocative, and only a handful of the forums have had visitors since they were launched last fall.

However, if you want to market your skills or contact other women Web pros, the directory here is a decent source.

MentorNet

www.mentornet.net

Interested in mentoring a young woman studying engineering or computer science? Here's your chance to sign up for a unique e-mail relationship with an aspiring female student. This is the most actionable resource for high-tech women on the Web, offering them a chance to make a profound contribution to the field.

— Leslie Goff





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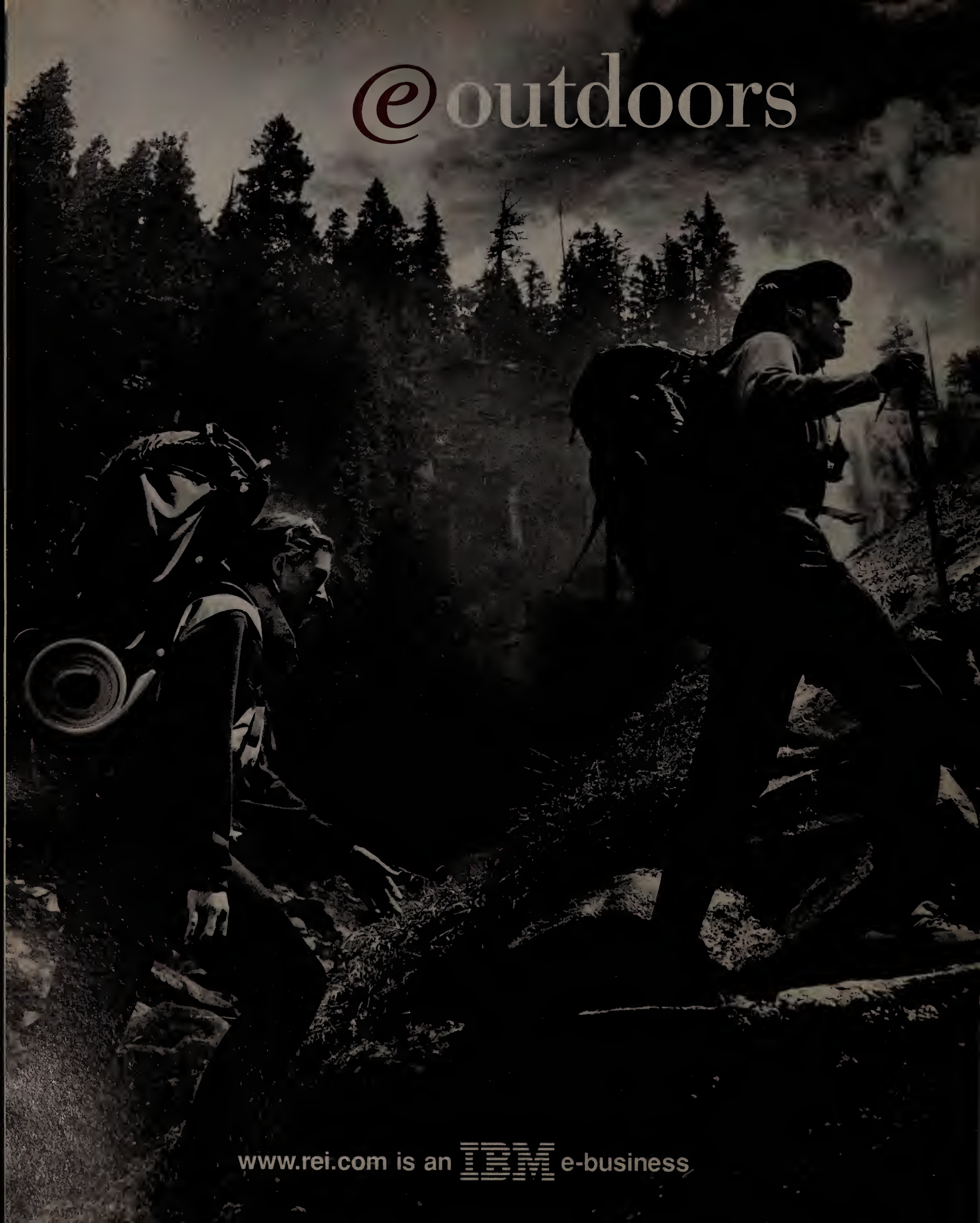
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A black and white photograph of two hikers on a rocky trail. The hiker in the foreground is on the left, wearing a backpack and looking down. The hiker in the background is on the right, also with a backpack and using a trekking pole, looking forward. The trail is rocky and surrounded by a dense forest of evergreen trees under a cloudy sky.

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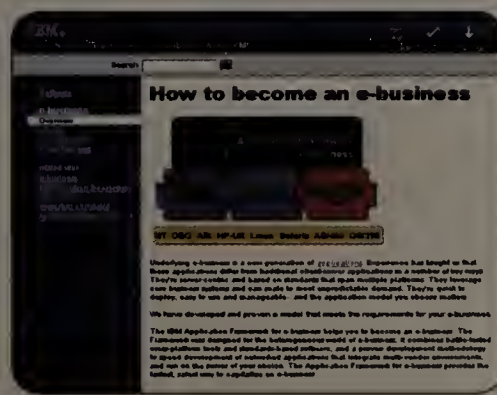
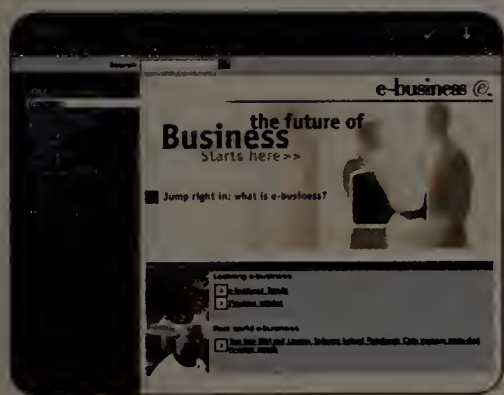
Can IBM e-commerce software help you?

IBM software is helping thousands of companies build, run and manage powerful interactive e-commerce Web sites. For REI, that means everything from state-of-the-wilderness gear you can buy to clinics on outdoor skills, enthusiast bulletin boards and a world of trips and tours. The scope of REI's offerings led them to IBM.

IBM software provides the building blocks for all facets of e-business, including secure payments, electronic catalogs, and order processing. For REI, proven products, such as Net.Commerce, DB2® Universal Database™ and IBM Firewall deliver the scalability, reliability and security it takes to reach, sell and service a growing community of outdoor enthusiasts.

The results have been nothing less than astonishing. In the first quarter alone, REI's sites generated online sales that exceeded projections by over 360%. And these e-sales are 4 times the size of those in their brick-and-mortar counterparts. Bottom line, REI is growing profits far beyond its wildest expectations.

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Workin' the Web

The Internet has become *the place* to find a new job. Here's some advice about how to make it pay off **By Claire Tristram**

WHEN ROY Seeber's job as senior information analyst at Canada Mortgage and Housing Corp. in Ontario was eliminated last year, he decided to try his hand at job searching on the Web.

Within three days of posting his credentials on Dice.com, an online employment site for information technology professionals, Seeber had accepted an IT job at Metamor Worldwide Inc. in Phoenix — along with an \$84,000 salary. That was a \$29,000 raise from his last job, or \$9,666.67 for every day he was looking for work.

"I landed on Dice.com by accident after doing a search on Yahoo," Seeber says. "I really didn't know what to expect. But after I posted my requirements, I was inundated with phone calls, all from people looking for someone like me."

Meanwhile, when T. Daise grew tired of her \$20,000-per-year teaching salary at a Fort Lauderdale, Fla., junior college, she too went job searching online — for technical training jobs. Within a month, she had doubled her salary and now earns \$40,000 per year as a corporate technical trainer.

"I was desperate. I'd tried headhunters and agencies, and nothing came of it," Daise says. "They are inundated with unqualified people, so I got the runaround. Looking for a job online allowed me to take control of my job search."

Within a matter of months, the Web has evolved from an interesting place to dabble for

a job hunt to an absolute necessity for IT professionals looking for their best employment opportunities. It's not just the convenience of online searching that has job seekers hooked — it's also the sheer breadth of jobs that are now posted online, particularly in technical fields.

Count the Gains

For many job seekers, using the Web leads to bigger money, better opportunities and the all-important perk of bypassing the piles of snail-mail résumé cluttering the desks of hiring managers. Many companies post job listings on their Web sites now as a matter of course; even something as simple as regularly reviewing the Web sites of companies that interest you can give you a lead of hours, days or weeks over candidates using traditional job search methods.

"In any job search, speed and access to information are critical," says Mark Mehler, co-author of *CareerXRoads: The 1998 Directory of the 500 Best Job, Resume and Career Management Sites on the World Wide Web*. "On the Web, you can reach tens of thousands of companies by pointing and clicking. You can search job listings in 900 or more newspapers. Typically, a classified ad will run only one Sunday and appear in print several days from being submitted to the newspaper. The same ad will be online within 24 hours and will stay there until the job is filled. So anyone using the Internet will have instant access to the best information on available jobs."

The Web works best for professionals looking for similar work in their current field and for those who are between jobs and therefore not worried about a current employer seeing employees' résumés posted online. Your search will be boosted if you have specific programming skills that will show up in keyword searches. And a willingness to relocate will also improve your chances of success because you'll be able to take full advantage of

the Web's worldwide reach.

The more specific skills you have and the more flexible you are about relocation, the more likely you are to be inundated with opportunities.

"Within two hours, I had my

I think being free to relocate is really the key to a successful online search.

**JOSETTE KOOL, CONSULTANT,
ZEITECH INC.**

first call," Seeber says. "After that, I received 10 messages a day. Not one lead was a waste of time because I'd been very specific about my skills and very detailed about what I was looking for, and I was willing to relocate."

"I think being free to relocate is really the key to a successful online search if you're interested in finding a job quickly," agrees Josette Kool, who posted her résumé on two IT-related job sites. Within two weeks she had signed on at Merced, N.J.-based consulting firm Zeitech Inc. — and promptly relocated from Las Vegas to Tampa, Fla.

"I'd advise people to calculate their relocation costs and cost-of-living fees appropriately if they go this route, because I've found you can negotiate for just about anything," Kool says.

Request Privacy

Although posting your résumé and job requirements on the Internet isn't the most private way to look for a job, the Web is rapidly becoming a useful job search tool even for those with privacy concerns. Many sites provide job requirements confidentially and will e-mail you information about jobs that meet your

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PHILIP ANDERSON

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Workin' the Web

Continued from page 56

criteria — it's up to you if you want to respond.

"You have to be concerned if you're employed, if you're sending your résumé somewhere online," Mehler says. "Be sure to ask for and receive the security you need. On some sites you can exclude certain e-mail addresses from reviewing your résumé, or you can exclude personal information."

"At last count there were 145 sites that also offer 'push' technology to give you the information you need about jobs right in your mailbox. The Web is getting the message that people need to have their privacy protected."

In any job search, speed and access to information are critical.

MARK MEHLER, CO-AUTHOR, CAREERXROADS

What kind of IT professional has the best luck with online searches? For the most part, nonmanagerial, technical positions or entry-level positions make up bulk of opportunities, but that bias is changing fast as human resources managers get more comfortable with online recruiting.

As employers and human resources managers warm up to the Web, postings for managers and higher-level positions will also become more common, Mehler predicts. "Over the last year, six-figure job postings have definitely become more prevalent," he says. "It pays to remember where you went to school. I've seen the higher-level jobs turn up with increasing frequency on college sites."

"Colleges are looking to Web sites not just to help current students, but also to attract alumni and their donation dollars."

Tristram is a freelance writer in San Jose.

How To Find a Job Online

Surfing the Web for a potential new job can be a career eye-opener. Just follow these tips:

What's the best way to find a job online? Mark Mehler, co-author of *CareerXRoads: The 1998 Directory to the 500 Best Job, Resume and Career Management Sites on the World Wide Web*, advises this strategy.

1. Location, Location, Location

Decide whether you're open to relocating or not. "You'll avoid wasting time with sites that don't have a lot of opportunities in your area of the country if you decide up front you don't want to move," Mehler says.

2. A Bit of Detective Work

Target specific companies you're interested in working for and search their Web sites. Most companies now put their job listings on the Web and will save electronic résumés for up to a year.

3. It's How You Say It

Make sure your résumé includes the appropriate buzzwords so that the résumé will appear when hiring managers do a keyword search. Familiarize yourself with the vocabulary of a given company's Web site to make sure your résumé uses the same terms for given skills or activities.

4. All the Help You Can Get

Take advantage of professional and school associations. Check your college Web site for alumni job listings; cruise the sites of professional asso-

ciations you belong to for listings or career help.

5. Matches Made in Heaven

Look for opportunities on Web sites that cater to your technology expertise. Some highly focused technical fields offer professionals thriving sites such as Digital Cat's Java Resource Center (www.javaresource.com) for Java specialists and MacTalent (www.mactalent.com) for Apple experts. A simple search can lead you to sites that cater to your area of expertise and that may have far more relevant job listings for you than larger sites.

6. The Bigger They Are

A few big sites have risen above the hundred of thousands of sites that now post job listings and do merit your special attention. Mehler's favorites for IT professionals include:

- ComputerJobs.com (www.computerjobs.com).
- Developers.Net (www.developers.net).

- Dice.com (www.dice.com).

- Jobs for Programmers (www.prgjobs.com).

Evaluate each site for the number of hits they

return for the job skills and companies you're most interested in. "Companies tend to gravitate to certain big job-listing sites, and each of these sites has developed its own areas of strength," Mehler says.

7. Picky, Picky, Picky

Be selective. Evaluate each site carefully before deciding where to post your résumé or to spend your time.

"There's a temptation to plaster your résumé everywhere you can. Don't do it," Mehler says. "Follow the same general guidelines you do in any kind of job search by targeting what you want and going after it. The Internet allows you to find the job

you're looking for quickly and efficiently if you do your research and find the sites that deal in your niche."

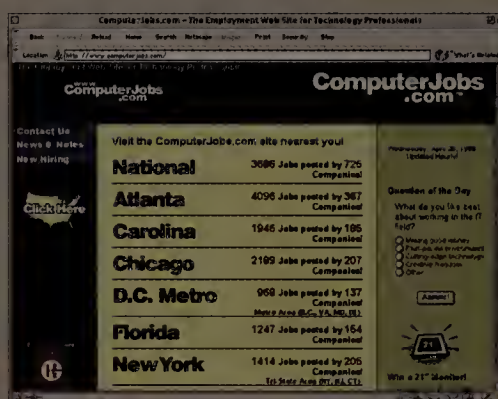
— Claire Tristram

Look for opportunities on Web sites that cater to your particular technology expertise.

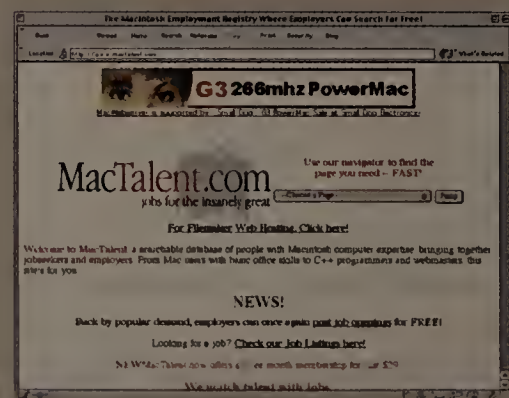
www.dice.com



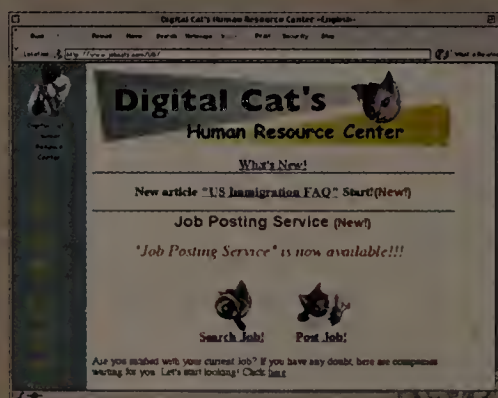
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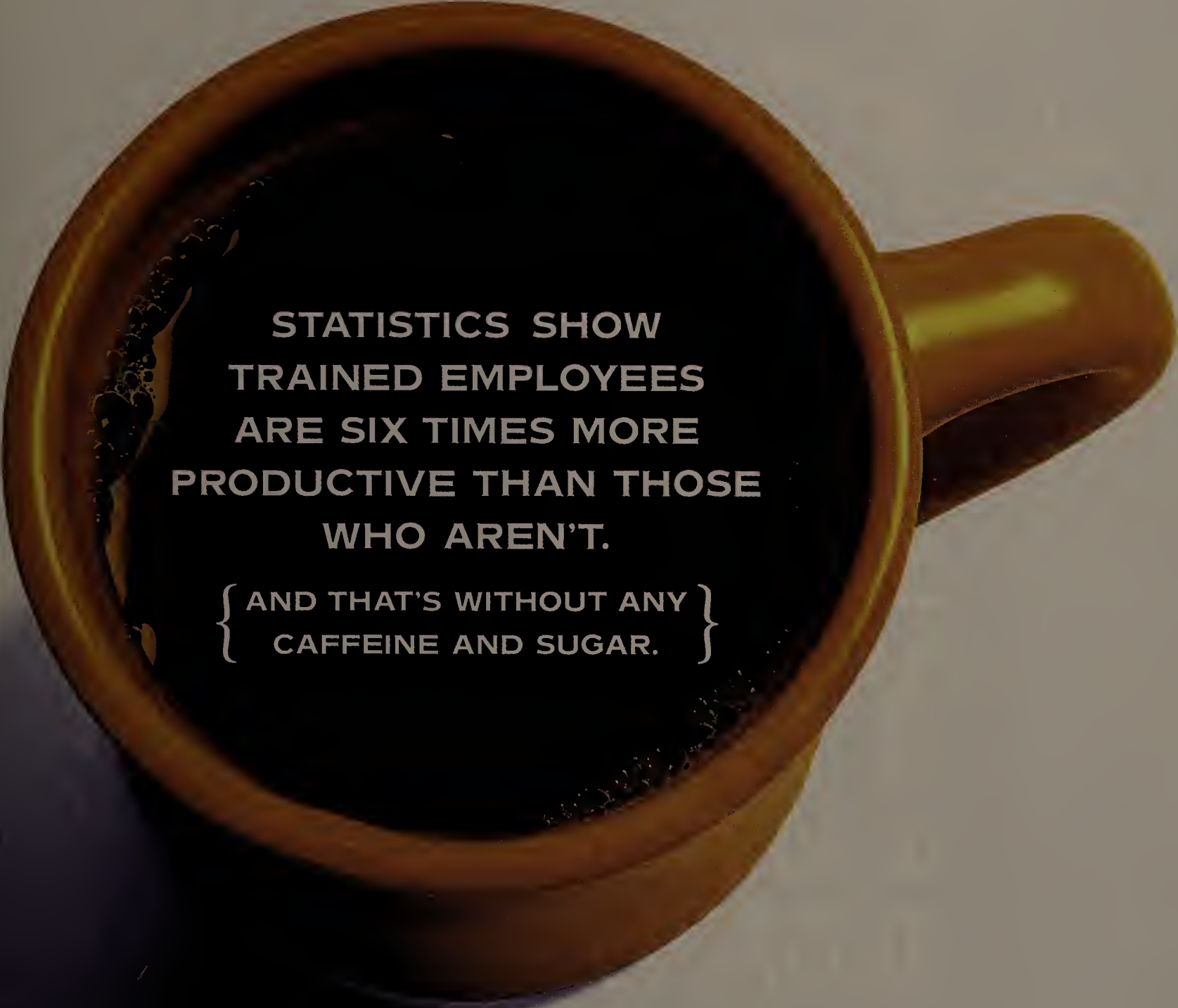
www.mactalent.com



www.jobcats.com/us

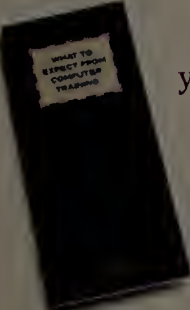


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JOE AUER/DRIVING THE DEAL

Handshake isn't enough

A MAJOR CONSULTING firm runs TV ads touting its prowess and successes. Your neighbor, who just got downsized, presses his business card into your hand after church because now he's a consultant, too. Today, consultants are holding themselves out as experts on almost any subject — and they're finding lots of work. The problem is that many consulting relationships aren't built on an agreement for specific results, but

largely on personal rapport between the consultant and the corporate decision-maker. More often than not, the client signs the consultant's form agreement — or even worse, does a "handshake deal" in which there's no contract.

Regardless of the size of the deal, key issues need to be addressed when hiring a consultant.

Always have consultants work under a written contract — your written contract. It should contain all the guiding principles, performance commitments, roles, responsibilities, rights and obligations of the parties.

What follows are the key issues:

■ **Expertise.** Consultants should be hired because they have expertise you don't. The preface of the contract (the "recitals" section) should have some key

points included. First, state that the consultant represents that he is an expert in the tasks and functions to be performed. State that you're relying on the consultant's expertise to meet the assignment objectives. That approach allows the introduction of a malpractice claim in the event of a dispute.

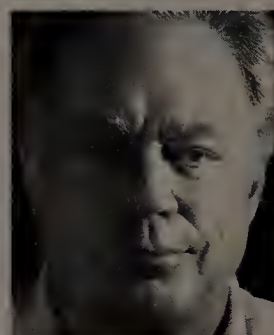
Also, list other events and the consultant's representations that led up to the contract to show how you were induced into the agreement. That could prove powerful later on if the consultant made any fraudulent inducements.

■ **Deliverables.** The agreement must clearly specify what the consultant is going to produce, for what price and within what time frame. There must also be acceptance criteria specifying when a result is deemed complete and delivered.

■ **Ownership of work product.** Who owns what is important. If you don't obtain ownership rights, the consultant can reuse your stuff and get paid all over again. The rule here: If you pay for it, you own it.

■ **Payment.** Your payment obligations should be triggered only by the consultant's actual performance and your acceptance of the results. Avoid up-front payments tied to nothing more than signing the contract or a calendar date.

■ **Confidential information.** A mutual confidentiality clause should be in the contract, in which both parties agree to protect the other's confidential information.



JOE AUER is president of International Computer Negotiations Inc. (www.dobetterdeals.com), a Winter Park, Fla., consultancy that educates users on high-tech procurement. ICN sponsors CAUCUS: The Association of High-Tech Acquisition Professionals. Contact him at joea@dobetterdeals.com.

■ **Indemnification.** Your consultant should agree to protect you against any claims by third parties resulting from the consultant's work for you. Examples include claims attributable to the consultant's negligence, violation of a third party's intellectual property (as in using software that wasn't properly licensed), damages to persons or property and viola-

tions of trademarks. That may seem trivial or even remote, but it could cost you millions of dollars to defend or settle. It's better to get the protection up front.

■ **Your competitors.** If the consultant is doing mission-critical or competitive-advantage type work, it's reasonable to ask for a provision in which the consultant agrees not to provide similar services for your competitors for some period of time, usually one or two years, after completion of his work for you.

■ **Early termination.** To protect yourself against a sudden

change in business conditions (like a project cancellation), have a 30-day cancellation privilege with your only obligation being to pay for services rendered to date. But the consultant shouldn't be allowed to terminate unless you're in material breach of the contract.

■ **Independent obligation.** It's important that a consultant agree to continue working even in the unlikely event of a dispute between the two of you. That contract provision assures that you won't be held hostage by a work stoppage.

■ **Insurance.** Consultants should have adequate insurance coverage. That covers you in the event of claims or lawsuits brought against you as a result of the consultant's negligence.

Additionally, consultants should carry malpractice (errors and omissions) insurance so that any successful claims you have against the consultant could be paid. Each policy should have coverage of at least \$1 million and name you as an additional insured party.

Remember: A consultant is an outsider you invite into your business. The consultant's primary objectives are to minimize his risk while maximizing his profits — at your expense. ▀

WORKSTYLE BRIEFS

Start-Ups Beef Up Their Bonuses

Tech start-ups have always used stock options as a way to boost pay and incentive programs. But a recent study showed a big jump — 20% — in the amount of stock they're offering as well as some cash bonuses, which were unheard of in the past.

That's according to a study of 120 technology start-up companies released last week by Advanced-HR Inc. in Saratoga, Calif., which specializes in compensation planning for pre-initial public offering tech companies. Of the companies surveyed, about 100 were in the San

Francisco Bay area. The average financial backing per company is about \$16.6 million.

The increase in nonsalaried compensation isn't always across the board — companies use the incentives to hire key people and to get them to stay a few years, said Dee DiPietro, president and principal analyst at the firm.

Options usually take four years to mature, though they can take three years at some e-commerce companies where the development cycle is faster.

"The earlier you join, the more stock you have," DiPietro said. Of course, "There's a correlation between risk and the amount of stock that you get," she added.

Another change from earlier years is an increase in the number of cash bonuses. Of the surveyed companies, 62% reported giving executives bonuses that averaged 30% of base salary. Four years ago, cash bonuses weren't offered at all, DiPietro said.

Although the highest bonuses and the most stock options may go to select strategic employees, technology start-ups do offer competitive compensation for midlevel staff, DiPietro said.

Another Jobs Site

Of the people, by the people, for the people. No, not the Constitution; we mean *techies.com*. This job search Web site purports to be "led by people who lived and breathed in the IT industry."

Besides articles, automatic notification of job postings and the ability to screen employers before telling them who you are, the site offers listings in the following nine cities: Austin, Texas; Boston; Chicago; Dallas; Denver; Phoenix; Portland, Ore.; Seattle and the Twin Cities region.

Portable Ergonomics

Do you miss your ergonomically correct footrest when you're away from the office? Not to worry. A folding, portable model that weighs less than a pound is available from High Street Emporium for those late-night hotel e-mail sessions. Folded, it measures approximately 4 by 8 by 1 in.; expanded, it becomes a 4-in.-high footstool to relieve lower back pain.

The footrest costs \$24.85 and is available by calling (800) 362-5500 or at www.skymall.com. ▀

SNAPSHOT

Watching Over You

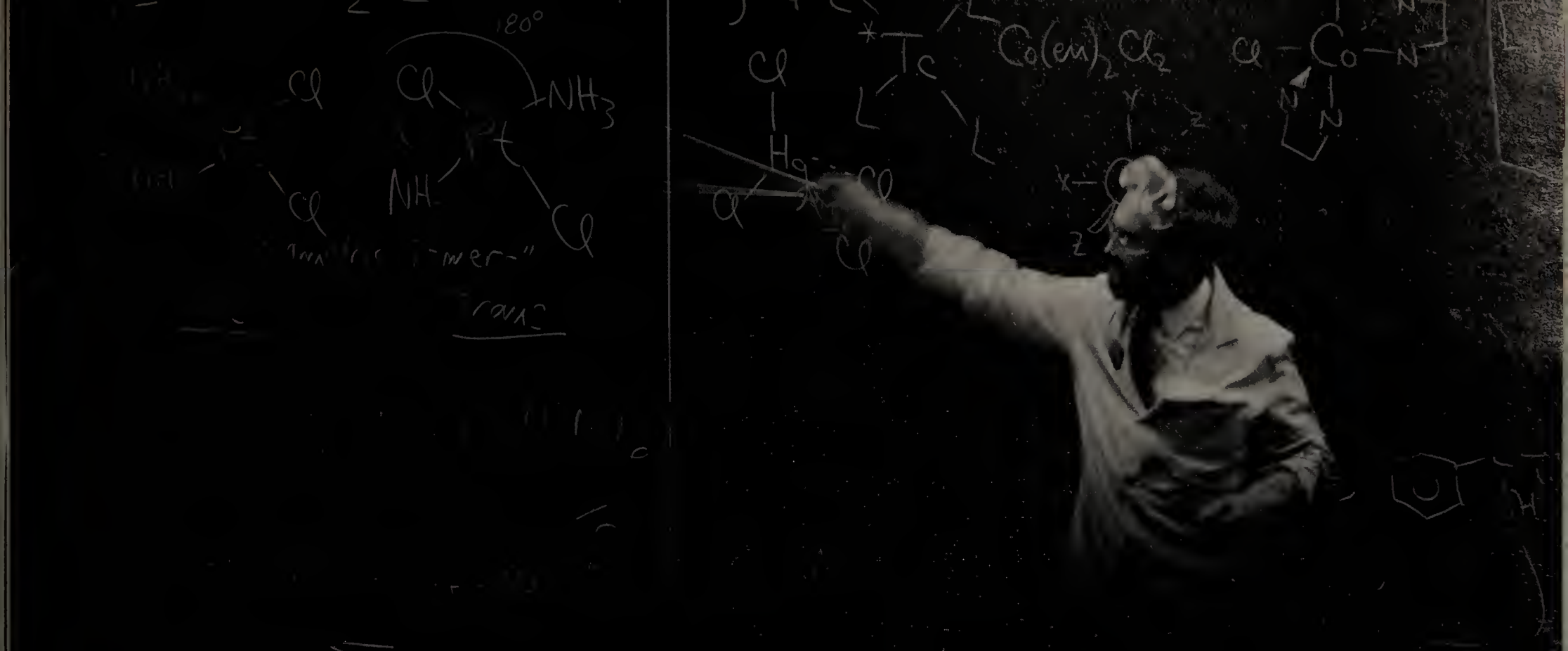
Percentage of U.S. companies that monitor employees' use of Internet e-mail:

1997	20%
1998	27%

Percentage of U.S. companies that electronically monitor internal e-mail, phone and computer communications:

1997	35%
1998	45%

Source: 1000 Companies and the Internet: Monitoring & Restriction, June 1998



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SERVER-BASED REPORTING

Location, location, location: Mortgage giant Freddie Mac eased the strain on its network and its PCs by centralizing frequently needed reports on a single server. **▶ 67**

PDM GETS SOUPED UP

It's not glamorous — it's product data management software. It's historically been used primarily by engineering departments, but spurred by new tools from SAP, Parametric Technology and others, product data management is showing the potential for wider use. **▶ 64**

MP3 DOWNLOAD

QuickStudy and Exec Tech explain and test MP3 — the audio standard for downloading music from the Web. **▶ 76, 77**

UNHAPPY NEW YEAR

When the Russian New Year virus hit in January, your PC could catch it only if you clicked a link at a Web site. But a diabolical new twist could make even unread e-mail a carrier. **▶ 72**

EMERGING COMPANIES

If you let BizRate put a free questionnaire on your Web site, it'll give you free reports on what

customers think of your site. The drawbacks: It doesn't survey those who left without buying, and detailed reports will cost you extra. **▶ 74**

FOR YOUR EARS ONLY

Telephone encryption is a nice wish-list item, but at \$3,000 a pop, it's out of reach for most. But Starium is set to launch units featuring 168-bit Triple DES and 2,048-bit Diffie-Hellman key exchange technology at \$100 each. **▶ 64**

NOT-QUITE-EASY MIDDLEWARE

Graphical development tools are increasingly common and can make middleware development easier. But make no mistake: GUI or no GUI, developers still need to know what they're doing. **▶ 66**

A REAL THIN-CLIENT BOOM?

After years of false starts and fizzles, thin clients are ready to take off, two reports predict. Really! The reason? Microsoft has blessed the idea. **▶ 69**

FLASHBACK

In 1967, Doug Engelbart applied for a patent on something he called an X-Y Position Indicator. That's "mouse" to you and me. **▶ 84**

MORE

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JACK BUFFINGTON, director of electronic business at Orion Auto, is launching an extranet to serve the company's 12,000 independent agents

FUTURE.COM: IT AND THE NET

THE MATURING INTERNET is poised to reshape the way many companies operate. But for that to happen, new technologies are needed and IT managers must become more realistic about the Net's strengths and weaknesses. Vint Cerf points to skyrocketing traffic as a potential problem; routers' inability to keep up is another.

80

FOR YOUR EARS ONLY: INEXPENSIVE TELEPHONE ENCRYPTION ARRIVES

CallGuard — a voice-encryption unit half the size of a PalmPilot — is one hot item

BY ANN HARRISON

IN THE WAKE of FBI warnings that U.S. firms are losing billions of dollars annually from stolen trade secrets and the theft of intellectual property, a California company is preparing to market a device that uses powerful encryption technology to secure telephone conversations.

CallGuard, to be launched this summer by Starium Ltd. in Monterey, Calif., is a portable, battery-operated voice-encryption unit half the size of a PalmPilot. It encrypts voice signals with 168-bit Triple Data Encryption Standard and 2,048-bit Diffie-Hellman key exchange technology — which is also used by the National Security Agency's STU-III (Secure

Telephone Unit). STU-III costs \$3,000, but CallGuard will cost \$100.

CallGuard will plug into a standard telephone handset and digitize voice transmissions, clean up interference, compress the signal and transmit it with virtually no delay, said Bernie Sardinha, Starium's chief operations officer.

Regular Calls

The call recipient will have to use the technology to ensure encryption of the voice transmission, but users will also be able to make regular phone calls. "You press a button to 'go secure,' and you can plug it into any phone, anywhere in the world," he said.

FBI director Louis Freeh said in February that U.S. firms

are losing \$2 billion a month to corporate espionage, including illegal eavesdropping. Despite those threats to sensitive data, most point-to-point voice encryption systems on the market use weak, 40-bit encryption keys.

When AT&T and Motorola Corp. moved a decade ago to market phones with more powerful encryption, the U.S. government demanded a key escrow system that would allow it to decrypt voice traffic. The government is no longer pushing for key escrow, but the demands effectively chilled market initiative.

Lee Caplin, Starium president and CEO, said the company has received thousands of orders from law firms, financial corporations and other businesses that want to secure the communications of their midrange executives. Sun Microsystems Inc. has purchased approximately 30 CallGuard

You press a button to 'go secure,' and you can plug it into any phone, anywhere in the world.

BERNIE SARDINHA,
CHIEF OPERATIONS OFFICER,
STARIUM

units. Starium will offer free CallGuard units at its Web site (www.starium.com) this summer in exchange for user feedback, Caplin said.

He said Starium will also

market a CallGuard unit for private branch exchange phone systems in which the "go secure" feature can be used to encrypt voice-mail retrieval and faxes. The company is also targeting the consumer market: It expects to roll out a single-chip and software solution for digital cell phones. Motorola and AT&T are also working on phone encryption strategies.

Promising Niche

Chris Christiansen, a security analyst at International Data Corp. in Framingham, Mass., said the market for chip-level devices for cell phones is promising because it's fairly easy to scan for cell-phone conversations. "If you use a scanner to target individuals in corporations, you could find something interesting. There have been plenty of instances [in which] cell phone conversations have been picked up and publicized," he said. ▀

Putting 'Glam' in Product Data Management

Web-based tools are expanding beyond engineering departments

BY CRAIG STEDMAN

Unglamorous product data management software is starting to show a little flash — and the potential for wider corporate use.

Historically, product data management (PDM) was mostly confined to engineering departments that wanted to store information about product designs.

But that's all changing as enterprise resource planning (ERP) vendors like SAP AG and Baan Co. get serious about PDM. For example, SAP is now marketing its PDM software in the U.S. and plans to release a more cohesive set of product data applications this summer.

Meanwhile, developers of stand-alone PDM applications

are turning them into Web-based systems that can be used throughout a company — and by customers, suppliers and distributors — to check on products from the design stage onward.

That's the plan at Timberjack Group, a Finnish manufacturer that's installing Parametric Technology Corp.'s Windchill PDM software to track the 250,000 parts that have been used in its forestry equipment in the past 50 years.

Going forward, Timberjack will also use Windchill to hold information such as documentation and an online parts manual, said Tim Whitlock, manager of system support at Timberjack's offices in Woodstock, Ont.

The goals are to make prod-

uct data more widely available and to better support customers by keeping track of machines "until they disappear into the forest and we never hear from them again," Whitlock said.

Windchill lacks key features such as support for pulling old parts records from several homegrown systems, Whitlock conceded.

That's forcing Timberjack to do some custom development, but consulting costs are expected to be no more than twice what the company paid for the software. According to a press release, Parametric said Timberjack paid \$2 million for the Windchill software and associated services.

In the past, PDM consulting bills often ate up to seven times more money than the technology cost, said Bruce Jenkins, an analyst at Daratech Inc. in Cambridge, Mass. But the software is now more of a

finished product, he said.

Parametric, in Waltham, Mass., released Windchill a year ago. Other vendors offering similar PDM packages include Enovia Corp. in Charlotte, N.C.; Milford, Ohio-based Structural Dynamics Research Corp.; and Unigraphics Solutions Inc. in St. Louis.

By midyear, Lockheed Martin Corp.'s government electronics systems division in Moorestown, N.J., plans to start rolling out Windchill to 3,000 users — one-third of them customers and suppliers that want to collaborate on product development.

End-user training needs

should be minimal because of Windchill's browser-based user interface, said Kevin Hamm, the division's director of information technology.

He said Windchill looks to be a better fit for product data than ERP — an opinion seconded by Whitlock.

SAP got its first U.S.-based PDM user in March when Storage Technology Corp., a maker of data storage devices in Louisville, Colo., turned on R/3. An upcoming R/3 upgrade to Version 4.6 "is where [PDM] starts coming together as a real product from SAP," said Bill Swanton, an analyst at AMR Research Inc. in Boston. ▀



LOCKHEED'S KEVIN HAMM: Windchill tool minimizes training

JUST THE FACTS

PDM Software Highlights

What product data management software (PDM) does: Automates the tracking and updating of information about products, such as design specifications, documentation, manufacturing plans and spare-parts records

Who sells it: ERP vendors such as SAP and Baan; makers of PDM and product design software such as Parametric Technology Corp., Structural Dynamics Research Corp. and Unigraphics Solutions

Size of the market: Users spent \$1.4B on PDM applications and consulting services last year, according to market researcher CIMdata Inc. That was up 27% from 1997

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VISUAL TOOLS TARGET MIDDLEWARE MUDDLE

Drag-and-drop replaces some coding

BY DAVID ORENSTEIN

MORE DEVELOPERS are using familiar graphical tools to work with middleware because it makes their jobs easier. But to work with back-end middleware, developers still must know some details of the architecture.

Alone or with integrated tools, visually oriented rapid application development environments are exposing developers to middleware such as IBM's CICS and the Common Object Request Broker Architecture (CORBA). These visual

tools hide the complexity of middleware by letting developers navigate distributed environments visually instead of with text commands.

Inprise Corp. in Scotts Valley, Calif., has announced its JBuilder3 tool, which includes several visual tools for managing CORBA. Sybase Inc. in Emeryville, Calif., last month released its Enterprise Application Studio, which lets developers for the first time deploy objects written in PowerBuilder 7.0 alongside other objects on its application server. IBM recently announced that it acquired a tool, called Inter-

space, that allows users of PowerBuilder and Visual Basic to visually connect applications with MQSeries messaging, CICS mainframe transac-

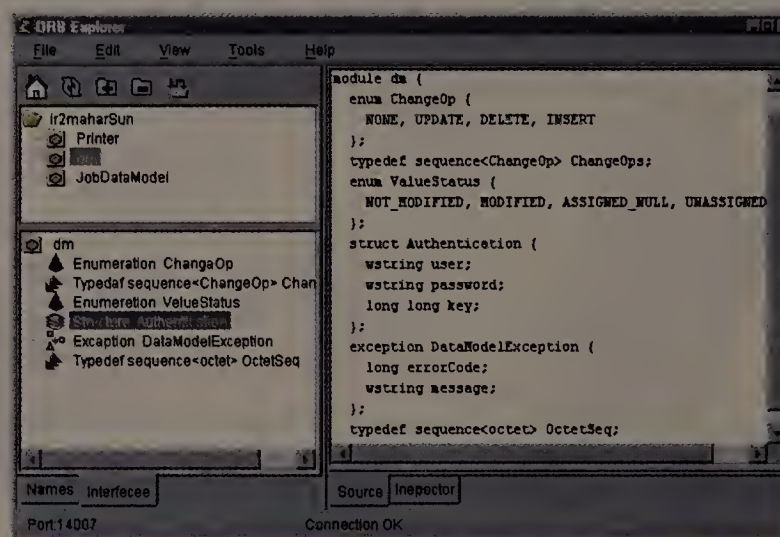
tion and the WebSphere application server middleware products.

JBuilder3's visual CORBA tools are easing T. Rowe Price Investment Services Inc.'s transition from C++ and the Distributed Computing Environment to a Java/CORBA architecture, said Dion Hinchcliffe, technology development

manager at the Baltimore-based company. The ORB Explorer, for example, visually guides users through identifying objects, but the developer must still supply the object's interface definition language (IDL). "IDL writing is not for the faint of heart," Hinchcliffe said.

Companies seeking to make server-side middleware development easier for client-focused visual developers must realize that visual tools are no substitute for an understanding of complex application architectures, said David Kelly, an analyst at Hurwitz Group Inc. in Framingham, Mass.

Bill Barnett, director of the distributed object integration team at First Union Corp. in Charlotte, N.C., said many of the tools have the potential to make development easier. But "the more a tool does *for* you, the more it does *to* you," he cautioned. ■



ORB EXPLORER can ferret out the location of visual objects

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Server-Based Reporting Eases Desktop Crunch

*Freddie Mac uses Actuate system
to centralize reports, trim PC workload*

BY STEWART DECK

A year ago, Freddie Mac Corp. was in a pinch: Its internal users needed better access to the large volume of data the McLean, Va.-based mortgage-loan purchaser received from banks and lenders. It also had outside users clamoring for access to loan reports via the Web.

Freddie Mac's programmers responded by writing reports using Seagate Software Co.'s Crystal Reports and Information Builders Inc.'s Focus, recalled Dwight Handon, director of applied technology. "But these were both client-based tools, and we were killing the PC with the volume of data we

were trying to pass through," he said. Several reports running simultaneously could slow the network to a crawl; overburdened PCs even crashed.

"We knew something Web-based was the way to go, but we also knew that HTML wouldn't do, because you can't always guarantee what it will look like and where columns are going to appear," said Reginal Smith, a programmer/analyst at Freddie Mac. After examining various Web-based tools, the company settled on Actuate Software Corp.'s Actuate Reporting System.

"A report server takes the

workload off the client," Handon said. "Now, if five people need to see a report, it can be stored on the server instead of tying up desktops with five instances of the same report."

Several analysts agreed that Actuate is one of the leading Web-based report server vendors. Although many report generators now have Web features, Actuate's object architecture and multithreaded server give it more capabilities and power, analysts said.

In a Web-based report scheme, all reports are centralized securely on a server and accessed by users with Web browsers, unlike older client/server systems that installed an entire report-reading application on each desktop.

Actuate's report server sorts the data into predefined re-

ports and lets users request existing reports and specific HTML pages. It also allows them to build their own report. The Actuate multithreaded

server is well-suited to customers with a growing data environment, said Bob Moran, an analyst at Aberdeen Group Inc. in Boston. It also cuts training costs by allowing end users to use online analytical processing products they already know, added Jackie Sweeney, an analyst at International Data Corp. in Framingham, Mass.

Moran said Actuate takes more time to set up than other

tools because of its object-backbone architecture — meaning that each piece of data becomes an object that can be sorted and stored.

A server-based system also requires administrators to provide the proper server horsepower — and possibly a dedicated server.

Still, "the big payoff for us now is that we can provide these reports to external parties and we don't have

to worry anymore about configuration issues outside Freddie Mac," Smith said. "The next, [Extensible Markup Language]-based version is supposed to be even easier." ▀

We were killing the PC with the volume of data we were trying to pass through.

DWIGHT HANDON,
FREDDIE MAC CORP.

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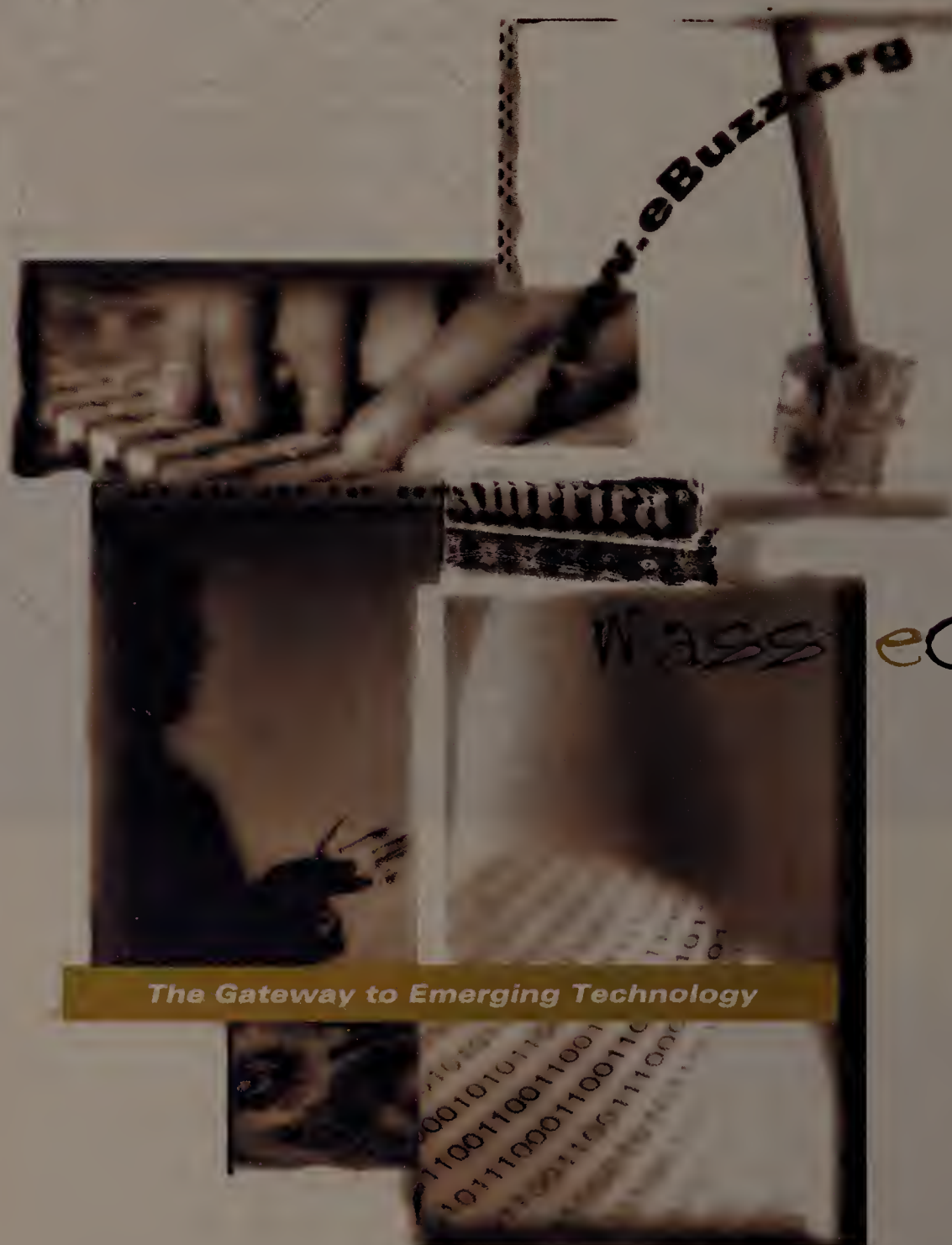
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'VERTICAL' HANDHELDS CHOSEN OVER BIG NAMES

Palm, Win CE devices get spotlight, but some users like simpler, tougher models

BY MATT HAMBLIN

CHUCK Schoenberger, director of operations at a West Coast home builder, chose ruggedized handheld computers for his company's inspectors after a three-year handheld evaluation.

Analysts said his choice is an example of a trend in handheld use in vertical industries such as trucking and manufacturing. These users are choosing devices that are more durable than the typical PalmPilot and Windows CE-based handhelds and often sacrifice keyboards for the simplicity of pen-based input.

In choosing a device for field inspectors at The O'Brien Group in San Mateo, Calif., Schoenberger tested several models running the Palm and Windows CE operating systems but settled on the DataRover840 from privately-held DataRover Mobile Systems Inc. in Sunnyvale, Calif.

The DataRover runs a reliable operating system known as Magic Cap, which is "extremely customizable" for various applications, said analyst Jill House at International Data Corp. in Framingham, Mass.

"The DataRover is a little bigger than the others and a little more user-friendly," Schoenberger said. He decided workers needed a pen-based system rather than a keyboard

because they would be holding the device in one hand and marking a checklist with the other. The DataRover recognizes handwriting, but that function is less important than the ease of clicking on a checklist. It also has a backlight and a screen that functions in both sunlight and darkened rooms, Schoenberger said.

"We looked at all the alternatives and felt they weren't powerful enough, or [were] too awkward to use or didn't use the right operating system to take to the open architecture of our computers," he said.

Inspectors will use custom applications developed with



CHUCK SCHOENBERGER of The O'Brien Group: "We looked at all the alternatives and felt they weren't powerful enough"

the help of Sentel Corp. in Alexandria, Va. Among other features, the applications pro-

vide inspectors with a checklist with more than 30 questions they can answer with the

touch of a pen as they judge the quality of everything from plumbing to drywall to floors.

On April 20, The O'Brien Group announced a start-up program in which quality assurance inspectors will use DataRovers. The firm may expand the program to include home buyers, who will be able to use them for walk-throughs to note items that need correction, Schoenberger said.

The company still must decide whether to send reports wirelessly from homes under construction or to allow workers to synchronize with a cradle at an O'Brien Group office.

Analysts said there is an active market for handhelds in vertical industries. In the U.S., the market is expected to reach 1 million units shipped this year and grow to 1.6 million in 2002, according to IDC.

Analysts list Symbol Technologies Inc. in Holtsville, N.Y., Telxon Corp. in Akron, Ohio, and Intermec Technologies Corp. in Everett, Wash., as the largest vendors of handhelds for vertical markets. ▀

Microsoft Nod Gives Thin Clients a Boost

Reports predict three-year boom

BY STACY COLLETT

If you've been thinking about replacing or enhancing your company's PCs with thin clients, now may be the time, according to market research firms International Data Corp. (IDC) and Zona Research Inc.

Really.

You've heard about the alleged "year of the thin client" before. But since Microsoft Corp. gave thin-client technol-

ogy its blessing last summer in the form of its Terminal Server Edition software and lower prices, information technology decision-makers appear to be confident the technology has a long-term future.

More hardware options and lower prices will join Microsoft's blessing to propel thin-client sales to 2.2 million units by 2001, with revenue of \$1 billion, according to separate reports by IDC and Zona. Last year, 350,000 units were sold, and revenue was \$287 million, down 18% from 1997's \$350 million. Thin clients include Windows-based terminals, network computers, Internet PCs and generic thin clients that access server-based network applications.

Analysts acknowledged that they've been wrong about the thin-client market before. Unit sales last year were only 70% of IDC's forecast of 500,000. Zona had to revise its predictions early last year after Terminal Server Edition's release was pushed back to June.

But this time, "all the pieces are finally in place" in terms of

hardware and software, said Eileen O'Brien, director of IDC's thin-client program in Framingham, Mass. Terminal Server Edition lets IT centrally access and monitor its Windows applications.

Many customers held off on thin-client purchases as they evaluated the product. Terminal Server's hefty price also kept prospective users at bay. But in January, Microsoft lowered the \$259-per-user price tag to \$109, plus \$40 for a Windows NT client/server access license.

"It has really taken the Microsoft acknowledgement of the thin-client server model" to make it successful, said Greg Blatnick, an analyst at Redwood City, Calif.-based Zona.

Hotel chain Loews Corp., which installed 55 IBM Network Station thin clients at the front desk and administrative offices at two of its hotels, welcomed Microsoft's backing. Because of compatibility issues, "it just makes sense," said Bill Kreuter, MIS manager at Loews Miami Beach Hotel in Florida.

In addition, Fort Lauderdale,

Thin Options

How will you deploy thin clients?

- 49% To replace PCs
- 47% To use in addition to existing PCs and terminals
- 36% To replace text-based terminals
- 19% To replace other desktops
- 8% To replace X Window terminals

Base: Survey of 247 IT directors; multiple responses allowed

Fla.-based Citrix Systems Inc. released MetaFrame software last June. The tool lets IT connect to Terminal Server Edition from non-Windows desktop and mobile clients, including Unix and Macintosh, allowing mixed-client environments to reap the benefits of Terminal Server Edition.

On the hardware side, several terminal makers have developed Windows-based terminals that provide display capabilities for applications that run off WinFrame or Terminal Server Edition servers. ▀

SNAPSHOT

PC Shipments Soar

Worldwide PC shipments, first quarter 1999

	Q1 1998	Q1 1999	% CHANGE
Compaq	3.05M	3.35M	10%
Dell	1.54M	2.30M	49%
IBM	1.61M	2.11M	31%
Hewlett-Packard	1.32M	1.49M	13%
Gateway	779,000	1.08M	38%



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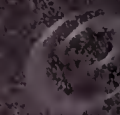
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RUSSIAN NEW YEAR'S DIABOLICAL TWIST

Virus is delivered in e-mail attachments that don't need to be opened to infect

BY DEBORAH RADCLIFF

SUPPOSE IT'S possible to send an e-mail containing a hidden construct," said an information security director. "And when the user opens that e-mail, the construct will run without the user ever knowing anything."

Imagine those constructs can do anything their creator wants them to: Secretly copy and download proprietary information, delete the BIOS or reformat your machine.

It's real. The security director, who asked for anonymity, was talking about Russian New Year with a twist.

Discovered in January, Russian New Year exploits the Microsoft Excel CALL functions used to call other Excel functions such as create, write, close, execute and sum.

So what's the twist? Originally, the only way to contract the virus was to visit a Web page and click an HTML link. Now, Russian New Year can be sent via mass mail programs, with the link embedded or as an attachment. Newer browser programs will automatically execute CALL to fetch the embedded document or prepare to open the attachment — so the e-mail recipient needn't even open the e-mail to get infected.

"Russian New Year is a way

of attacking you without you knowing you've been attacked. It really does this," said Ira Winkler, president of Severna Park, Md.-based Information Security Advisors Group and author of *Corporate Espionage* (Prima Publishing, 1997).

The good news: There are no known reports of Russian New Year attacks on enterprises. And that's why most folks just don't want to talk about it — they're afraid of letting the cat out of the bag. "If Russian New Year wasn't publicized, people might not exploit it. On the other hand, there are a lot of users who are vulnerable," Winkler said.

Now the bad news.

The hack is so subtle, it's likely that if they have been hit, security administrators don't know it. Excel spreadsheets, for example, could be easily and secretly copied to a browser, according to an April 17 alert issued by Finjan Software Ltd., an Israel-based maker of mobile code security software (www.finjan.com/rny/rnyl.cfm).

Sneak Attack

Under certain conditions, users wouldn't have to manually open HTML attachments or click on embedded links to let the attack in.

"Russian New Year gives attackers the ability to deliver any payload they want," said

Penny Leavy, Finjan's senior vice president of global marketing. "Your antivirus software won't catch this. Your firewall won't catch this."

More bad news: The attack is difficult to prevent. Microsoft Corp. has patches, but only for Excel 97. If your users are running Excel 95, you must first upgrade them to Office 97, then load service releases 1 and 2, then load the patch — which pretty much kills the CALL function altogether.

"Until vendors configure Web browsers to not allow embedded Excel CALL functions, this problem really can't be fixed unless you cancel your Excel CALL functions," Winkler said. Unfortunately, "some people ... use the CALL func-

Your antivirus software won't catch this. Your firewall won't catch this.

PENNY LEAVY,
SENIOR VICE PRESIDENT,
FINJAN SOFTWARE

tion all the time," he added.

Financial services firms, for example, rely on CALL to import data from their enterprise resource planning software databases into spreadsheets, Leavy said.

The simplest fix is education. Remind users not to open HTML attachments or click

embedded links in e-mail files unless they explicitly trust the source, Winkler said. But there's another possible diabolical twist, he adds: If New Year is teamed up with the mass-mailing technology behind the recent Melissa virus, the e-mail will appear to come from a trusted source.

Leavy suggests raising browser-security levels and configuring dialog boxes to send alerts when a program or a Web site is set to call other functions.

Because there's no simple way to block Russian New Year, Winkler advises information technology managers to ask, "Is the benefit of using CALL functions worth more than the potential risk of using them?"

Radcliff is a freelance writer in the San Francisco area. Her Internet address is derad@aol.com.

HACK
OF THE MONTH

Madge Pitches Managed Network Services

To focus on existing customers first

BY BOB WALLACE

Falling sales of its core Token Ring products have driven Madge Networks NV to enter the global network services market, an initiative that will likely be a tough sell to information technology managers who aren't Madge customers.

The plan is for Netherlands-based Madge to sell its managed voice, data, virtual private network and Web-hosting services to its Token Ring customers through a recently acquired international network that it's expanding.

Madge's sales of Token Ring adapter cards, hubs and switches dropped from \$59.5 million in last year's first quarter to \$37.7 million in this year's first quarter, according to the Dell'Oro Group Inc. in Portola Valley, Calif. In the same period, overall revenue fell from \$90.6 million to \$48.8 million, and the company went from a net quarterly profit of \$2.8 million to a net loss of \$8.5 million.

Madge could be successful selling network services to its Token Ring customers but will

likely find it tougher to land new accounts, analysts said.

"They'll be selling to a different department, but there's no better reference than one from a group that's received Madge's stellar service and support on their Token Ring products," said Eric Hindin, an analyst at The Yankee Group, a Boston consultancy. "They're not going to reach a billion dollars, but they could be a good second-tier service provider."

That's because Madge will have great difficulty competing against entrenched competitors such as MCI WorldCom Inc., said Charles Rustein, an analyst at Forrester Research Inc. in Cambridge, Mass. "Incumbents already have big data centers, more robust networks and [big-name] customers, which is credibility in a nutshell. Success on the product side doesn't automatically assure success in network services."

To its credit, Madge has spent almost \$40 million on a network with 80 entry points in 31 countries. The vendor has two data centers — both in the U.K. — and has been hiring top executives from major carriers to direct the effort. It plans to add entry points and data cen-

ters in the U.S. A few Madge users expressed some interest. "We may want to look at them in the future, but right now, management of our [international] data lines is something we want to keep," said Luis Castillo, a research analyst at Principal Financial Group in Des Moines, Iowa. The company links sites in Mexico, Argentina, Brazil and Hong Kong to its office using 56K bit/sec. and 1.544M bit/sec. T1 lines.

Madge Strategy

Madge expands into network services:

Core business: Token Ring LAN hardware

Supplemental business: ATM switches, video networking packages

Temporary business: Ethernet switching

Newest business: global network services

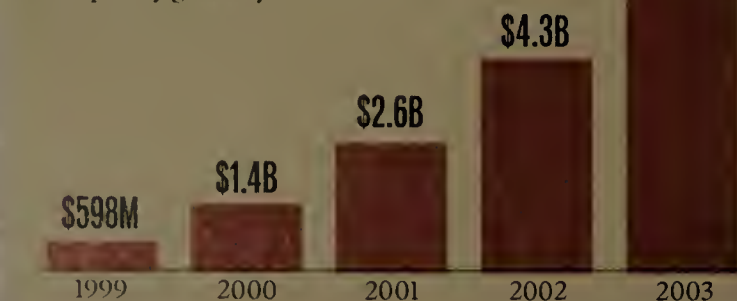
Managed offerings:

- Voice services
- Data services
- Virtual private networks
- Application hosting
- Web hosting

SNAPSHOT

Calling up the Future

Worldwide revenue projections for IP telephony gateways: *



* Computers used for placing voice and fax calls on IP data networks

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WHO BUYS WHAT ONLINE, AND WHY

BizRate offers free feedback, but will anyone pay for the details?

BY CYNTHIA MORGAN

FROM A marketing perspective, BizRate's story couldn't be clearer: Provide customer-generated ratings of e-commerce sites on the front end while selling targeted demographic information on the back end. BizRate Inc.'s service is rapidly becoming a coveted seal of approval in some e-commerce markets.

What's less obvious, however, is the system's value to information technology managers: In exchange for permission to place a lengthy ques-

tionnaire on customer order forms, BizRate provides free, ongoing reports of customer feedback at the site.

The reports may reduce the cost of monitoring the site to analyze customer behavior or cost less than developing after-market surveys to achieve the same end. The reports can also make a good impression on customers simply by asking them how they liked the site and offering solicitous follow-up queries.

BizRate's eventual goal is to sell more extensive reports and product marketing analy-

sis to corporate customers. Beyond that, the company plans to deliver prequalified, ready-to-buy customer "buying clubs."

Farhad Mohit, BizRate's CEO and co-founder, says the company's goal is to become the Nielsen rating system of e-commerce. It's off to a good start. While there are services that rate Web commerce sites and services that rate which sites offer the best pricing, BizRate is one of the few that asks customers to rate the entire purchasing experience.

Pop-up Survey

BizRate's survey form pops up once a customer has clicked the "submit order" button on a merchant's site. The questionnaire asks buyers to describe their purchases, then rate their satisfaction with the site's product presentation, navigation, ordering procedures and general convenience. Respondents are also asked for basic demographics and to rate their own experience with online buying. An automated agent sends a follow-up questionnaire to make sure the product arrived on time.

The data is added to BizRate's existing ratings for the company based on previous surveys. Customers can view the cumulative ratings by product category.

Participating companies receive a free monthly report that compares customer comments against benchmark ratings for their industry.

The system rates a merchant's site based on customer pricing perceptions, product breadth, available product information, ease of ordering, Web-site navigation and appearance, on-time delivery and several other issues.

Monthly survey results can be a great addition to standard site logs and log analysis tools. Information from customers

who purchased items despite a problem can be especially valuable.

The free reports give general ratings and customer comments, which can be valuable, but detailed information on features that either led to a purchase decision or turned off customers comes from the more extensive paid reports.

Charges for personalized, paid reports and market research start at \$12,000 per year.

BizRate surveys only those customers who purchased a product, not those who left without spending any money, so reports may not capture problem areas that drive away potential customers.

And to be effective, BizRate must collect data from all the major players in a market, something that rarely happens in its product categories right now. The company bridges the gap with staff-led ratings of "silver," or nonparticipating, merchants by secretly buying products online and following the purchase process to the end. But the real credibility of the site comes from customer feedback on participating, or "gold," merchant sites.

The number of heavy hitters in e-commerce that aren't on board with BizRate — including Borders.com, CDnow.com, Amazon.com Inc., Gap Online, L. L. Bean Inc. and Eddie Bauer Inc. — is daunting.

Still, BizRate has the jump on potential competition. And adding a BizRate survey to a commerce site's customer order form is a simple matter of adding a few lines of HTML code to the Web page. It can be an inexpensive way to fine-tune the usability of a commerce site and ensure good online business practices. ▀



Rating BizRate

E-commerce merchants that include BizRate's survey on their site can get free, less-detailed reports or buy detailed versions. Buzz from both sides:

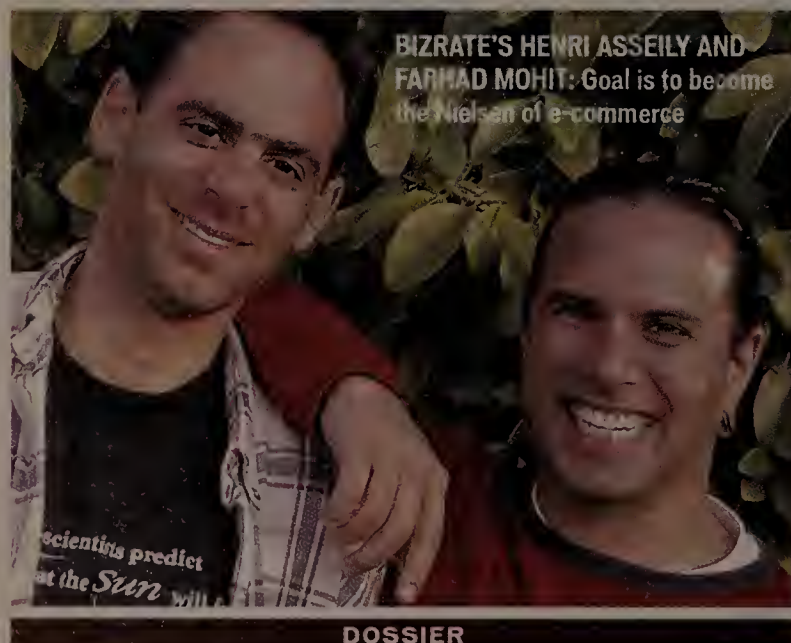
Getting It for Free

■ "We're taking advantage of the free service because it gives us a lot of valuable feedback we can't get anywhere else," says Lawrence Becker, director of Internet publishing at Crutchfield New Media LLC (www.crutchfield.com) in Charlottesville, Va. "You can't buy a good BizRate rating, you have to earn it."

"They give a really nice breakdown not only of site esthetics but of a lot of other things, such as delivery time and customer satisfaction," he says. "If we weren't doing well in a specific area, our BizRate results would let us know pretty quickly, and we could fix the problem before it became too big." Becker concedes that "I'd like to see more specific information on what the customers actually thought of the Web site."

Paying for It

■ "We buy the research reports" from BizRate, says Barbara Bry, vice president of marketing and business development at ProFlowers.com in La Jolla, Calif., which does about 90% of its business on the Web. "It's saved us from having to develop a customer survey system of our own, and it provides us with an incredible amount of information. People tell BizRate things they wouldn't tell us." ▀



DOSSIER

BizRate Inc.

Location: 4053 Redwood Ave., Los Angeles, Calif. 90066

Telephone: (310) 305-3506

Web site: www.bizrate.com

Niche: Rating system for e-commerce sites that lets IT managers provide customer feedback at very low cost

Company officers: Farhad Mohit, president, CEO and co-founder; Henri

Asseily, chief technology officer and co-founder

Milestones: Founded in 1996

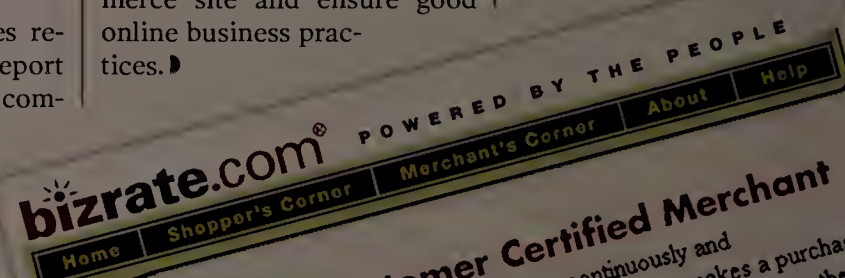
Burn money: Primary funding comes from two venture capital firms: Mission Ventures and Media Technology Ventures

Customers: Office Depot Inc., Egghead.com, Crutchfield Media LLC, Intuit, ProFlowers, Macy's, CompUSA

Potential stumbling blocks: Several sites now provide pricing and product evaluation information; adding e-commerce site ratings to these sites could dilute BizRate's impact.

Merchants we've talked to think that BizRate's free reports, given in exchange for adding the survey tool to customer order forms, are sufficient for many of their purposes. Persuading merchants to buy the more comprehensive reports could prove problematic.

BizRate is banking on customer demand to drive merchant cooperation, a questionable premise if competitors show up.



BizRate.com has agreed to allow BizRate to continuously and independently survey the satisfaction of every customer who makes a purchase from its website, thus earning the title of "Customer Certified." Below are the latest ratings from the actual on-line customers of Music Boulevard.

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Report Card

★★★★★ = Best

bizrate.com
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Merchant: Music Boulevard

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out of five stars

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★★★★★
★★★★★
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MP3

DEFINITION

MP3, which stands for Motion Picture Experts Group-Layer 3, is an audio compression format that creates near-CD-quality files that are 10 to 20 times smaller than music files on standard CDs. MP3 makes it possible to move high-quality sound files via dial-up modem and can pack 150 songs onto one CD.

BY CYNTHIA MORGAN

MP3 is rapidly becoming the standard for storing, trading, selling and stealing music via the Internet, according to analysts and audio experts.

Each minute of music on a compact disc needs approximately 10M bytes of storage space and takes a bit less than an hour to download via 28.8K bit/sec. modem. That means it could take two days to download an entire CD, so most people opt to simply buy the disc.

But by using MP3, a 600M-byte music CD can be shrunk to 50M bytes or less. It can be streamed (downloaded in chunks) so that you can begin listening to the opening bars while the rest of the file arrives in the background. And, most important, MP3 music

files retain good listening quality that earlier compression schemes lacked. That combination of features makes accessing music — and illegally distributing copyrighted music — on the Web practical for the first time.

To understand how MP3 works, remember that sound travels in constantly changing waves. To save sound onto a PC or compact disc, a computer records “snapshots” of those waves at short intervals, a technique known as sampling.

Playing back samples reproduces the original sound; the more samples, the more realistic the sound.

You’d need 2,500 samples per second to achieve the sound quality of a telephone call. For higher CD-quality mu-

sic samples you’d need a whopping 44,100 samples per second. Elvis Presley’s 137-second rendition of “Hound Dog” takes about 24.1M bytes of hard disk space; the MP3 version would need just 2.1M bytes.

MP3 encoding software — the application that actually builds the MP3 music file — saves parts of the sound sample most strongly recognized as music; what’s discarded doesn’t detract too much from the final quality.

The technology works best for bright, loud music such as rock ‘n’ roll. It makes richer classical music sound dull to trained ears. According to engineers at Fraunhofer Gesellschaft, the German company that invented much of the MP3 standard, “Hound Dog” is perfect for MP3; recorded in monaural sound in 1956, it’s full of hisses and pops that MP3 conversion software actually can eliminate.

MP3 is only the first step. Newer technologies such as Advanced Audio Coding (AAC), Microsoft Corp.’s Windows Audio 4.0 and AT&T Corp.’s a2b are being developed. AAC promises even better sound quality with slightly smaller files. Microsoft says its technology gives the same quality in half the space and also offers antipiracy protection that MP3 lacks. AT&T says a2b uses MP3-like technology but locks its tunes in playback-only mode. ▀

COMMON TERMS

MP3 Lingo

Terms you need to understand when learning about MP3:

■ CD Ripper

A program that pulls audio tracks from a compact disc and converts them to a format such as WAV or MPC for PC storage and playback.

■ Codec

(Compression/decompression or coder/decoder) A program that manages the conversion/translation of MP3 and other audio format files.

■ Decoder

A program that expands a compressed data file such as MP3 and converts it to a WAV file so it can be played.

■ Encoder

A program that compresses data, such as audio files, to smaller file formats such as MP3.

■ Filter Band

A set of sound measurements that an encoder can use to include or exclude sounds during compression.

■ Lossy Compression

A technique of reducing file size by discarding data. Lossy compression techniques, such as MP3, produce small files that don’t need to be decompressed before use, but at some loss of quality.

■ Player

A program or small device that plays MP3 and other audio files.

■ WAV

Short for WAVEform audio; pronounced “wave.” An audio format that stores high-quality — and usually very large — sound files.

How an MP3 Sound File Is Created and Played

It isn’t difficult to create MP3s. Use one of the widely available software packages from the Web

1



Start by playing a song, such as Elvis’ “Hound Dog,” on your PC’s CD-ROM drive.

2

Using MP3 software, downloaded from the Web, save the “Hound Dog” file to a local hard drive.

24.1
M bytes



3

The MP3 software reduces the file by discarding sounds outside its filter band and eliminating redundant sounds.

4

The “Hound Dog” file is compressed to 2.1M bytes. It sounds pretty good, though it has lost some information from the original CD recording.



2.1
M bytes

5

The MP3 file can now be played from the hard drive or uploaded to a portable MP3 player.



Portable MP3 players include Diamond Multimedia Systems Inc.’s Rio and Eiger Labs Inc.’s MPMan



Are there technologies or issues you would like to learn about in QuickStudy? Please send your ideas to QuickStudy editor Stefanie McCann at stefanie_mccann@computerworld.com

BY THE NUMBERS

How Small Can Audio Files Get?

File size and amount of time it takes to download “Hound Dog” in various file formats:

Type of file	File size (M bytes)	Download time (hours)
Music CD	24.3	1:36:22
MP3	2.2	0:08:46
RealAudio	1.4	0:05:31
Windows Audio	1.3	0:05:10

MOREONLINE

For more information about MP3, visit our Web site.
www.computerworld.com/more

Too Soon for Totable Tunes

BY HOWARD MILLMAN

THEY'RE COOL, unconventional and right now, they're the hottest new personal entertainment gadget. But before the current crop of MP3 players can serve the needs of business executives, they need to acquire greater storage capacity, bookmarks (to mark your place when you shut off the machine) and far more content designed to appeal to business listeners rather than teen-agers and twentysomething music lovers.

"MP3 is starting out slowly," acknowledges Dale Ford, a principal analyst at Gartner Group Inc. in San Jose. "As with so many things related to the Internet, it has the potential of growing far beyond where it is today."

I found working with MP3, a technology that is undergoing change on an almost-weekly basis, a bit of a bother. Downloading or sampling the tunes takes more time than I have patience for, and transferring them to the player takes yet more time. For example, it takes about 30 minutes to download 30 minutes of tunes from a Web site then another three or so minutes to download to the player. Also, you

can't dictate directly into Rio or MPMan, as you can with a minitape recorder. Although this lack of versatility limits MP3 players' usefulness as business tools, vendors are moving to overcome those limitations. For example, Milpitas, Calif.-based Creative Labs Inc.'s newly announced MP3 player, the Nomad, accepts direct dictation.

You can use your PC to access more than 100 MP3 Web sites and download digital music files to your PC, then to the player, through a parallel port. Most sites will let you listen to and, in some cases, download sample tracks. If you like the sample, you can buy the full CD. Alternately, if your PC's

CD-ROM drive plays audio CDs, you can copy tunes directly from a CD to the MP3 player.

It's easy to understand the appeal of MP3 players. Both players I reviewed weigh less than 3 ounces, are smaller than a deck of playing cards and hold up to 40 minutes of music in their shock-proof memory.

You can slip in optional memory cards and increase the playback time from 25 to 50 minutes; 16M bytes costs about \$45; 32M bytes costs about \$90. Because the units have no moving parts, a single AA battery powers them for 12 hours. Both units I tested delivered near-CD quality audio through their "bud-style" earphones. You can substitute regular earphones if, like me, you prefer not to stick things in your ears. ▀

Millman is a reviewer in Croton, N.Y.

The Story on Audio Books and MP3

MP3 content available today is about 95% music, providing you have a generous definition of the word "music." The other 5% goes to audio books or articles.

Except for a small sampling of mainstream titles, most spoken-word content such as audio books or audio articles comes from unknown authors with the names of body parts or bodily functions prominently featured in the titles.

The problems with MP3 beyond the poor content of music and books include technical shortcomings in the players. For example, you shut off the unit or the battery dies, and you have to

start at the beginning or go through a medieval process of physically recording track numbers. The second limitation is recording time. Even at the unit's lowest-quality audio level, listeners can't download an entire book or even most of one. To listen to an unabridged novel requires you to dump and reload content multiple times.

The players are better suited for shorter pieces such as magazine articles. For example, Audible Inc.'s Audible.com offers daily recorded excerpts from *The New York Times*, in MP3 format, for 95 cents per file or \$50 per year.

Dale Ford, a Gartner Group analyst, sees magazine articles and other short

selections as the most likely use for dictation on MP3 players. "If listeners download just what they need, then MP3's limitations will not affect them as much."

Representatives from Books On Tape Inc. (booksontape.com) and Audible, two of the leading recorded book sites, say concern over piracy, copyright and reduced royalties may keep accredited book publishers and authors from licensing their property for use on MP3 players.

If the idea of a portable book player appeals to you, look at the player sold by Audible (www.audible.com). One advanced model offers up to seven hours of play. Another works with Windows CE-based handhelds. Audible's player uses a proprietary and noncopy format, so it offers more than 7,000 mainstream books from prime publishers and prominent authors.



Diamond Multimedia Systems Inc.

www.diamondmm.com

Rio PMP300, \$180

(street price)

PROS: Rio's larger LCD and ample front-mounted controls make it easier to use than MPMan. Rio also uses a printer port bypass that lets you leave your printer hooked up as you download audio files. On the other hand, MPMan's setup requires you to disconnect your printer or install a second printer port. Diamond's newly announced 64M-byte model Rio provides about one hour of music playback and about three hours of spoken-word playback.

Lighter and more compact than portable tape or CD players, both the RIO and the MPMan are well-suited for exercise sessions or commutes.

CONS: Rio's audio management software, used to download files from the Internet to your player, is confusing. For example, to download a tune from your PC to the player, you click on "Memory." Why not just list it as "Download to player"? With the current crop of MP3 players, you must have access to a PC to change the player's content.

Eiger Labs Inc.

www.eigerlabs.com

MPMan, \$180

(street price)

PROS: MPMan's audio management software uses traditional standard file management screens and menus, making it easier to understand.

CONS: The unit's small LCD makes it difficult to read track information and music settings. Like Rio, it can't accept directly recorded messages. For long trips or listening sessions, Rio's greater memory translates into more playing time and less uploading, downloading, dumping and rejiggering of files. Still, cassette players are a wiser choice. You can get unlimited playing time by switching tapes.



Client/Server Labs and *Computerworld* help you pick the software management tool that will best suit your company

By Kenneth I. MacLeish

MANAGING NETWORK MANAGEMENT

INSTALLING, maintaining and updating software across a network takes an increasingly large portion of an information technology manager's time — and can add considerably to total-cost-of-ownership woes.

Tools such as Microsoft Corp.'s Systems Management Server 2.0 (SMS) and the AimIT and ShipIT products from Computer Associates International Inc. try to bring those software management problems under control.

With the release of SMS 2.0, Microsoft made some hefty boasts about the product's great software management. *Computerworld* and Atlanta-based Client/Server Labs Inc. investigated those claims, comparing SMS' capabilities with those included in an established suite of software management tools: CA's AimIT and ShipIT.

Both SMS and the CA suite handle a much broader range of functions than software management. They also detect and inventory hardware, for example. AimIT provides inventory and metering functions and ShipIT enables software distribution.

Reducing the number of

staff hours absorbed by manual, desk-to-desk application management can also mean major savings. Controlling the licensing, usage and distribution of software packages across a company is extremely labor-intensive for administrators and users alike. So we also looked at the CA and Microsoft offerings to see how well they bring software administration under control.

We found both products can go a long way toward reducing those costs. On the downside, the learning curve for both products is steep because of a necessarily complex user interface.

Grasping the fundamentals behind collections, discovery, packages and advertisements isn't easy, but it's the best way to get your money's worth out of either package.

Sites with a comparatively high degree of central control or that are standardized on the Microsoft operating systems might prefer SMS because it integrates smoothly with existing NT applications.

Organizations with more fragmented control structures or with significant mixed-platform networks will be drawn to the CA package.

PRODUCT SYSTEMS MANAGEMENT SERVER 2.0

Microsoft Corp.
(425) 882-8080
www.microsoft.com/smsmgmt

COST
\$1,129 for 10 site licenses

PROS: ▲
Tight integration with Windows 9x/NT; consolidated administrative interface

CONS: ▼
Limited support for non-Microsoft platforms; less flexible distribution of functions



How We Tested

We started by installing both products on a low-end NT server controlling a small, live production network. We first took system inventories, then allowed each server to monitor all software activity.

We configured and executed the functions for distributing a sample application: Microsoft

Outlook 98. We quickly discovered that Microsoft and CA use similar approaches to software control — but diverge significantly when it comes to distribution philosophy and platform support.

Not surprisingly, Microsoft's SMS 2.0 runs on Windows 3.x, 9x and NT 3.51/4.0. You'll generally get support for the Macin-

tosh through SMS 1.2 installations that are set up as daughter units within an SMS 2.0 installation. Novell Inc. NetWare networks are supported, but support for Unix and other platforms can be dicey.

By contrast, the CA products support client systems running Open VMS, IBM OS/2, Macintosh and several varieties of



PRODUCT AIMIT/SHIPIT (Enterprise Edition)

Computer Associates
International Inc.
(800) 225-5224
[www.cai.com/solutions/
enterprise_edition](http://www.cai.com/solutions/enterprise_edition)

COST
\$1,000 each for fewer
than 250 desktops: Work-
group Edition

\$2,000 for Enterprise
Edition

PRO: ▲
Much wider range of
supported platforms

CON: ▼
Less-consolidated adminis-
trative interface

Unix, along with DOS and all Windows flavors. In addition to support for NetWare and NT networks, CA's suite services AppleTalk, Banyan System Inc.'s Vines, DECnet, and IBM LAN Server and WARP Connect.

Managing Applications

Successful application management requires three fundamental tasks: inventory (knowing what's on your network), metering (managing software licenses) and delivery (efficiently adding upgrades and new applications). Microsoft combines all three into a single product while CA follows a component model, assigning the inventory and metering tasks to AimIT and the delivery aspects to ShipIT. But that separation isn't absolute: Both products tie into CA's Unicenter TNG Framework application.

We found the CA model allows greater flexibility in application installation, although its less-unified administrative interface can be inconvenient. Microsoft ties its administration into the Microsoft Management Console application, allowing the administrator to

build an all-in-one-place interface that CA can't easily match.

Hardware inventory — particularly knowledge of CPU, RAM and disk space — is a key component of software management. That's where your planning must begin. It's important to know what applications are already in place on your network, but discovering what your hardware can handle before you install a new application is equally important.

Taking Stock of Inventory

Microsoft's new software inventory tools give it the edge over CA. SMS 2.0's software monitoring agent actually scans the executable files' information, whereas AimIT relies on more static database comparisons. The latter process is great when applications are easily recognized but can be a problem when an application lacks the proper version and naming markers.

CA provides a starting collection of more than 4,000 applications in its database and the ability to add new entries as needed. We didn't find any holes in CA's database during our tests, but the database

method could potentially offer outdated information.

Microsoft should be congratulated for its emphasis on checking for year 2000 compliance within basic SMS queries. Administrators can add new database information as needed — and they will need to: The database provided at installation is limited to Microsoft's own product line.

Gathering highly detailed client software information can place significant loads on a network. We preferred AimIT's approach: The software returns data only on the items that have changed since the last scan. We especially liked the fact that the icons for changed values were displayed in a different color. That helped a great deal when scanning large quantities of on-screen data.

By giving administrators highly detailed control and monitoring of what applications are used by which users, licensing costs to a company can be drastically reduced. Both products use a pool of licenses, which can be made available as needed. Demand in excess of the available li-

censes may be denied outright, made available to high-priority users first or offered on a first-in/first-out basis. Or an administrator may simply define a group of applications that are permitted to run while locking out all others.

SMS bases its software metering tools on the LAN Licenser product from ABC Systems & Development Inc. The ABC package (www.abcsystems.com) has some creative features: It tracks usage by time for possible charge-back situations and can let mobile users check out a license for a period of time to accommodate off-line use. The checked-out applications return to the pool when the user logs back in or when the allotted time expires. SMS makes it difficult to avoid monitoring by having the metering tool check application resources for usage. It can also detect disabled client agents.

AimIT adds a potentially useful refinement with "suite metering," which allows the simultaneous use of more than one component of an application suite while counting only one used license. But administrators should be careful to check the licensing agreement for that particular product to verify that splitting is permitted.

Distribution Chains

Distribution of a new application to a large number of machines is probably the most tedious and time-consuming task for an IT staff. Add in the time to go from system to system, sign in, install and check the software and answer all user questions — and a five-minute installation to 100 systems becomes a significant chore.

You might think centralizing and automating that process would carry immense benefits. In reality, an administrator must configure a separate installation offering for each target platform. Unless your network is fairly homogenous, you may not save much time in the long run.

In general, we found that the software distribution differences between the products were fairly minimal and largely stylistic. In deploying our test Outlook application, we followed the same, basic route for both products: define which installation program was to be run, then specify the whos, whens and wheres of the dis-

tribution. Both systems allow the distribution of new applications to any combination of users, user groups, machines or network segments.

Both SMS 2.0 and ShipIT also have considerable scheduling flexibility that are designed to avoid excessive network loads. ShipIT adds a potential benefit by using the Wake-on-LAN feature available in newer hardware. It lets administrators remotely power-on idle machines for a new distribution. Microsoft adds rules-based distribution to SMS, which further automates the process. Properly deployed, reassigning a user from one group to another within the organization triggers a script that can delete unnecessary applications from — and add new ones to — the client as needed.

Out in the Wild

Both companies have applied creativity to the tricky problem of remote users on a wide-area network, who may have far less bandwidth available to cope with a large installation. ShipIT uses "polite agents" for those users, which allow new applications to be downloaded in the background as bandwidth becomes available. The software can coordinate that process over several connection periods, if necessary, before proceeding with the installation.

Microsoft's Courier Sender is less elegant. The administrator mails out software on CD-ROM or other physical media. When the software reaches the target destination, the local user simply places the disk in the appropriate drive, and the client completes the installation process according to the downloaded instructions.

Both the Microsoft and CA tools offer good software management capabilities for administrators who know how to use them properly. Your choice will likely come down to platforms: AimIT and ShipIT will probably be the answer for networks that have a wide variety of platforms. Microsoft shops, on the other hand, will appreciate the fact that SMS continues to play the hand of smooth integration with Windows. ▀

MacLeish is an analyst at
Client/Server Labs in Atlanta.

FUTURE

AS THE INTERNET enters its second quarter-century, it's poised to fundamentally reshape the way many companies operate. But for that to happen, some new technologies are needed and IT managers must become more realistic about the Net's strengths and weaknesses.

The future of the Internet is bound up in myriad technical issues, but the ability of the Net to accommodate skyrocketing traffic dominates all else, says Vinton G. Cerf, who specified the Internet's architecture and protocols in a paper published 25 years ago this month.

The Internet is growing at a rate greater than 100% a year, says Cerf, senior vice president for Internet architecture at MCI WorldCom Inc. in Jackson, Miss. "It has been doing that since 1988, and I'd say that will continue through 2006," he says. He estimates there will be 900 million computers and other devices, such as Web TVs and home appliances, on the Net by 2006.

According to Network Wizards in Menlo Park, Calif., there were 42 million publicly addressable computers attached to the Internet in January, up 69% from a year earlier. In the past six years, the number of Internet users in the U.S. rose 900% to 81 million, the company says.

But the increases in the numbers of users and hosts reflect only a fraction of the growth in total traffic on the Net, because users are increasingly turning to bandwidth-hungry applications such as Internet telephony, video, sound and the like.

Nevertheless, experts say hefty investments in optical fibers by telecommunications companies will

keep capacity ahead of demand and ensure enough excess capacity to keep downward pressure on prices. Meanwhile, new technologies on the horizon will greatly boost the capacity of conventional media.

For example, a promising new technology called "soliton communication" sends a pulse of light through a fiber without loss — the optical equivalent of superconducting. MIT's Lincoln Laboratory recently demonstrated a prototype soliton network operating at 100G bit/sec. And dense wavelength-division multiplexing in laboratory tests has been able to combine 100 colors of light, at 10G bit/sec. each, in a 1T bit/sec. optical fiber.

Although backbone capacity seems likely to grow adequately and affordably for the foreseeable future, there's less certainty about the ability of network routers to switch mushrooming volumes of data packets, raising the possibility that data packets might get dropped at peak periods. "Keeping up with that packet rate is a huge, huge challenge," Cerf says. "The new routers are keeping up, but just barely."

These new routers, colloquially called "BFRs" — or "big routers," Cerf explains — gain efficiencies from moving functions from software to hardware. A BFR from Juniper Networks Inc. in Mountain View, Calif., routes data in MCI's vBNS — very high-performance backbone network service — at 2.4G bit/sec. between



“
Eventually, pretty much everything we do with agents and customers will be on the extranet

JACK BUFFINGTON,
DIRECTOR OF ELECTRONIC BUSINESS, ORION AUTO

San Francisco and Los Angeles. "We are already looking at 10G bit/sec. for normal backbone speed, but they could not handle that today," Cerf says.

User Views

While telecommunications executives think globally, users think locally. Information technology managers are less likely to worry about capacity problems in backbones and routers than on the desktops of their employees and in the homes of their customers.

For example, Orion Auto, a \$650 million car insurance company in Englewood, Calif., will this month launch an extranet to serve its 12,000 independent agents. "Eventually, pretty much everything we do with agents and customers will be on the extranet," says Jack Buffington, Orion's director of electronic business. "We'll do both transactions and inquiries."

But, Buffington says, "Our biggest technical challenge right now is that we'll have many agents dialing in at slower transmission rates because of the telecommunications restrictions where they do business. We'll have to keep our forms fairly simple, but we'd like them to be more comprehensive in the future."

The issue of user access speeds also bumps up against privacy issues. "Encryption technology is fairly good, but the more we encrypt, the slower our performance will be to our agents, Buffington says."

.COM

By Gary H. Anthes

Past.com

An Internet timeline

1962 J.C.R. Licklider leaves Bolt, Beranek and Newman Inc. (BBN) to join the Department of Defense's Advanced Research Project Agency (DARPA).

1969 Department of Defense commissions Arpanet. (Though it is now

commonly believed the project goal was to create a communications system capable of surviving nuclear attack, Arpanet was actually conceived simply to save money by connecting researchers' computers.)

■ The first hosts are linked. They are: BBN, Stanford Research Institute, the University of California at Los Angeles, the University of California at Santa Barbara and the University of Utah.

■ An estimated 85 million U.S. televisions (97% of all U.S. viewers) watch Neil Armstrong and Buzz Aldrin (pictured) walk on the moon.



1972 In sending the first-ever e-mail message between two computers, BBN's Ray Tomlinson chooses the keyboard's @ symbol to separate the user's name from the machine's. "I got there first," Tomlinson later shrugs. "I got to choose any punctuation I wanted." Thus are icons born.

■ The InterNetworking Group

is formed, with Vinton G. Cerf as chairman. It's the first standards group to govern Arpanet.

1973 Robert Metcalfe invents Ethernet.

1974 BBN opens Telnet, the first commercial version of Arpanet.

■ Cerf and Bob Kahn publish a paper called "A Protocol

for Packet Network Interconnection." It features the design of something called Transmission Control Protocol, or TCP.

1979 Tom Truscott and Jim Ellis, graduate students at Duke University, and Steve Bellovin at the University of North Carolina establish the first Usenet newsgroup. It's

Continued on page 82

Kraft Foods Inc. in Northfield, Ill., has a Web site called Interactive Kitchens (accessible through www.kraft.com), where customers can find recipes and product information. It includes a consumer chat room and even offers an e-mail subscription service that provides weekly meal plans based on subscribers' individual likes, dislikes and health issues.

Kraft CIO Jim Kinney says it's important that food products be displayed with "good graphics and lots of colors" in order to be appealing. But going too far in that direction results in Web pages that can't be downloaded in a reasonable amount of time by home users. The solution will come when cable modems become commonplace, he says.

Clueless?

While Buffington and Kinney seem keenly aware of user response time issues, many IT managers are clueless about this subject, says Scott Bradner, a senior technical consultant at Harvard University in Cambridge, Mass. According to Bradner, many IT managers underestimate the demand that will be put on their Web sites and therefore undersize them. Others simply set unrealistically low Internet budgets.

"They should sit down and think about the real issues," Bradner says. "Don't criticize the technology if you're not spending enough on your Internet connec-

tion or if you buy it from the lowest-priced provider who oversubscribes their net 30-to-1."

Other IT managers hold back from exploiting the Internet's potential out of exaggerated fears about reliability and security, Bradner says. "For noninteractive applications such as mail and file transfers, reliability is extraordinarily high," he says. "Quality of service is not a problem in most instances, but people perceive it as a problem and therefore don't make use of the Net as much as they could."

As for security, Bradner says, "again, it's purely psychology. The technology is there, and we know how to do extraordinarily good security — good enough that the National Security Agency objects to it. It's available, but it's not understood, nor is it widely used."

Bradner, who is co-director of the Internet Engineering Task Force's (IETF) Transport Area, says quality-of-service technology coming out of the IETF will give IT managers much better control over their IP networks. "If you do not buy enough capacity, then you'll have the tools to allocate that capacity in a way that is more predictable," he says.

For example, the IETF's Differentiated Services Working Group has defined a field and a standard bit pattern in each IP data packet to indicate that it should receive a particular treatment as it moves

from node to node through the Internet. And the Resource Reservation Setup Protocol Working Group is putting the finishing touches on the RSVP protocol, which can guarantee bandwidth for an application such as video.

Those kinds of innovations are likely to make the Internet more attractive to companies like Federal Home Loan Mortgage Corp. (Freddie Mac) in McLean, Va., which provides basic information to the public via the Internet but relies on a private, IP- and Web-based extranet built on IBM's Global Network for its mission-critical applications. The extranet is used by 1,700 mortgage banks for conveying thousands of underwriting transactions per day, says Bill Ledman, senior vice president for information systems.

Reliability and security have improved greatly in the past two years, but the Internet isn't yet ready for Freddie Mac's e-commerce applications, Ledman says. The private extranet costs more, but "it's more secure, it runs faster and it's more reliable," he says.

Ledman says the day is probably coming when everything will run on the Internet and Freddie Mac customers will be able to specify — and pay for accordingly — the quality of service needed for a particular kind of transaction.

Continued on page 82

UUCP, for Unix-to-Unix CoPy, and is devoted to information-sharing among Unix users.

1981 BITNET (Because It's Time Network) is established.
■ Arpanet has 213 hosts and is adding a new one every 20 days.

1982 The TCP/IP protocol suite is established. In it, an "internet" is defined as a connected set of networks, specifically one using TCP/IP. The Internet is defined as connected TCP/IP internets.

■ EUNet (European Unix Network) is created. Its original connections are among the Netherlands, Denmark, Swe-

den and the U.K.

1988 The Internet Worm affects approximately 6,000 of the 60,000 hosts on Arpanet. Of its creator - Robert Morris - a family friend tells *Computerworld*: "He's not a nerd, not a geek and certainly not a purposeful wrongdoer."

■ CERT (Computer Emergency Response Team) is established by DARPA to address security concerns.



1989 Tim Berners-Lee proposes a project

called the World Wide Web while working at CERN, the European Laboratory for Particle Physics, in Switzerland.

1990 Arpanet is decommissioned.

■ The number of Internet hosts exceeds 300,000.
■ Berners-Lee, still at CERN, writes the first Web client and server software and defines specifications for URLs, HTTP and HTML.

1992 The first audio and video broadcasts take place over M-Bone.
■ There are more than 1 million Internet hosts.

■ In a June article, writer and librarian Jean Armour Polly coins the term *surfing the Internet*.

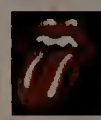
1993 The White House goes online.

■ The U.S. National Informa-



tion Infrastructure Act is established.

■ Mosaic, a graphics-based Web browser, is made available. It was developed by a team led by Marc Andreessen, an undergraduate at the University of Illinois, Urbana-Champaign.



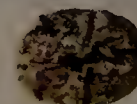
1994 The Rolling Stones broadcast their

Voodoo Lounge tour via M-Bone.

■ Andreessen and Jim Clark form Netscape Communica-

tions Corp.

■ Pizza Hut accepts its first order online (mushroom and pepperoni with extra cheese)



1995 Sun Microsystems Inc. launches Java.

■ America Online, CompuServe and Prodigy begin to offer Internet access.

■ Netscape goes public. The initial public offering price is \$28 per share. The stock opens at \$71. The age of the Internet millionaire is here.

■ The Vatican goes online (www.vatican.va).

1997 The American

Registry for Internet Numbers (ARIN) is established to handle administration and

registration of IP numbers.

■ The domain name "business.com" is sold for \$150,000.

1998 Network Solutions Inc. registers its 2 millionth domain name.

■ During a test of its Web site, ABCNews.com posts phony election results the day before the vote.

■ The Starr Report is posted online. Within four hours, it's downloaded between 3 million and 4 million times.

■ Sen. John Glenn travels to space once again. On launch day, CNN.com logs 494,000 hits per minute.

1999 The Melissa and Chernobyl viruses hit.

- Researched by Laura Hunt

New Paradigms

For some time, companies have had Web sites that offer information about themselves and their products. They are now entering a second phase of Internet use in which they exchange business transactions with suppliers and customers. In a third phase, barely begun, the Internet will fundamentally alter the way some companies operate.

For example, Kinney says Kraft may form consumer focus groups from those who visit its Interactive Kitchens, replacing the costly surveys now conducted at shopping malls. And Kraft might use some of those people as new product testers. "They would be cyberspace additions to our product teams," he explains.

Orion Auto's vision is to have an electronic federation of its agents and suppliers. Faster and more complete exchanges of information and services over the Internet would enable suppliers to serve customers

better and allow buyers to shop smarter, Buffington says. "There need to be these business communities on the Internet in order to make the Internet more successful for all of us," he says.

A key enabling technology for that kind of electronic community will be open-standards groupware, Cerf says. "This will be one of the next major areas for standardization. It's just not good enough to have a group capability in the company that you can't extend to groups across company boundaries," he says.

Work to define those standards is going on in the IETF and in Internet2 [CW, May 3].

Internet2 is a project of the University Corporation for Advanced Internet Development (www.ucaid.org), a consortium of 140 research universities that are connecting their campuses with a high-speed internetwork to operate at 2.4G bit/sec. The universities are also developing advanced applications in areas such as media integration and real-time collaboration.

Meanwhile, the Corporation for National Research Initiatives (CNRI) in Reston, Va., and others are pursuing research projects aimed at managing access to digital information. Those efforts are based on a concept that CNRI President Robert Kahn calls "digital objects."

"You get information on the Web, and you really don't know what you can do with it," Kahn says. "You may not know who owns it, what permissions you need or even who to go to."

A digital object contains data, a unique identifier and metadata such as access and copy restrictions, notices of ownership, licensing agreements and the like. That arrangement will make information a "first-class citizen" on the Net, Kahn says.

"A lot of these issues get lost in the noise today, but ultimately they must be addressed," Kahn says. "People are too busy putting their advertising on the Web to worry about issues of ownership and the like. But try to get something of substance on the Web — someone's crown jewels. You don't find it there."

Amazon.com Inc. provides an extreme example of the direction in which the Internet will move many companies, says Howard Frank, dean of the business school at the University of Maryland and a former director of IT at the Defense Advanced Research Projects Agency.

"Amazon.com has outsourced its logistics to FedEx, it's outsourced inventory to warehouses of distributors, it's outsourced its production to the book publishers," Frank says. "It's outsourced everything except sales and marketing — and IT, because that's the enabler."

"What's happening in the Internet world is that the value chain is becoming an electronically linked series of outsourced functions," Frank adds. "Fewer and fewer things are being defined as crucial to survival of the firm."

This shift will affect all companies to some degree and will provide tremendous opportunities for IT people, Frank says. "Now technology changes the very structure of the business, and IT is at the center of it," he says.

Advises Cerf, "Don't get too comfy with any model of how the Internet works, because it keeps changing, and people keep coming up with new ideas that none of us ever thought of before." ■

Anthes is Computerworld's editor at large. His Internet address is gary_anthes@computerworld.com.

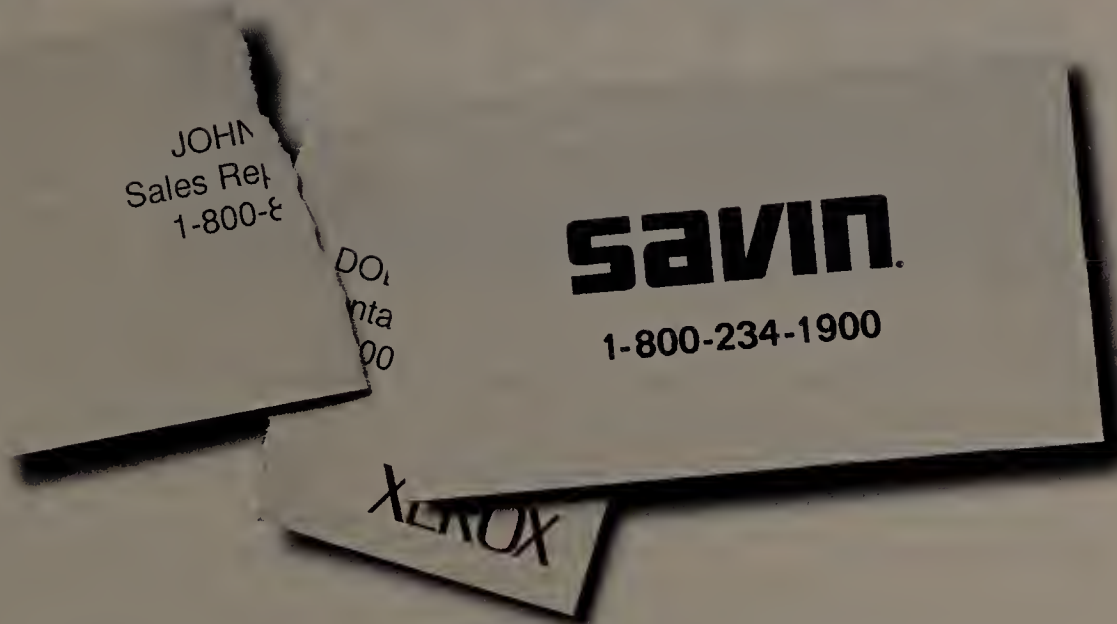
Just How Old Is the Net?

Everything about the Internet seems to cause raucous debate — including its date of birth. Some pioneers and experts equate it to the birth of Arpanet, the Defense Department's packet-switching network that grew into today's global Internet. Thirty years ago, Bolt Beranek and Newman Inc. installed the first Arpanet packet switch at the University of California at Los Angeles.

But Robert Kahn, one of the Net's founding fathers, says packet-switching isn't the defining characteristic of the Internet. In 1974, 25 years ago this month, the Institute of Electrical and Electronics Engineers Inc. published a landmark paper by Kahn and Vinton G. Cerf, "A Protocol for Packet Network Interconnection." It specified the Internet's architecture, described the Transmission Control Protocol and laid the foundation for TCP/IP — open standards that would allow data communication across heterogeneous networks.

"The Internet is its open architecture feature — TCP/IP," Kahn says. "The Internet meant that multiple, independent nets could federate using standard open interfaces and protocols." — Gary H. Anthes

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The Mighty Mouse

BY LAURA HUNT

ON JUNE 21, 1967, Doug Engelbart applied for a patent on his X-Y Position Indicator for a Display System, now better known as the mouse. It was a device that he had been thinking about and working on for more than a decade.

He publicly demonstrated the mouse a year later on the Online System. He also demonstrated videoconferencing and hypermedia. Those "inventions" weren't designed to make money or create a product. Rather, they were part of Engelbart's desire to "find much better ways for people to work together to make this world a better place."

Marc Andreessen, a co-founder of Netscape Communications Corp., has said of Engelbart and his colleagues, "The biggest difference in innovators like Doug is that the human impact was foremost in their minds, a social idealism that isn't there today."

Engelbart recently spoke with *Computerworld* about the mouse and its development.

Q: How did you come up with the idea of the mouse?

A: I had sketched it out in notebooks that I carried around for years. I had been thinking since around 1951 about using a computer interactively and had been exploring ways for people to increase their problem-solving capability on complex problems.

In the early '60s, I was at a conference, in a less than interesting session, and I started sketching out the concept, based on a funny device [a planimeter] that I had seen in a laboratory. I started to convert the mechanical device to digital distance and sketched out a device using two perpendicular wheels underneath to track motion.

In 1964, I think, we got money to do some experimenting with what kinds of devices we could use for pointing, and I went back and found my notes on the device.

Q: Why a mouse, instead of other devices?

A: There were four or five of us involved in the research, getting it built and so on. After experiments with other devices (light pens, joysticks, etc.), the mouse outshined them all. We started using it ourselves. We were looking for the best, most efficient, device. The team developed a set of simple tasks and timed a group doing the tasks with the various devices, and the mouse performed the best.

Q: Why is it called a mouse?

A: It looked like a mouse with a tail, and we all called it that in the lab. After we started using it ourselves, and then it became more and more widespread, we felt that it would get an appropriately dignified name, but it hasn't!

Q: The world got a look at the

DOUG ENGELBART patented the mouse in 1967



mouse during a now-famous 1968 demonstration at the Stanford Research Institute (SRI), which is still referred to as "the mother of all demos."

A: Yes, the mouse was just a piece of the demonstration of "augmenting knowledge workers." The rest of the world was focused on "office automation," feeling that the "real user" of computers was a secretary who needed tasks automated. This was very disappointing to us and pushed us out of research for a while.

Then I ended up at the [SRI], where I could pursue my goal to develop systems that would augment the human intellect. At the end of 1968, we had developed not only the mouse, but also full-screen editing, a Windows-like interface, links and hypermedia, a sort of PowerPoint. We also demonstrated teleconferencing, using leased video lines and camera views of my colleagues in the lab. It showed collaborative computing — an intuitive picture of how things could be.

We also used a chord key set [a five-finger equivalent of a keyboard] as a pointing device,

which I still use on my computer today.

Q: How close are we to your goal of augmentation vs. automation?

A: Not that close. Well, if you think of the problem as 20,000 feet high, we are now at the Everest point, say 6,000 feet. It's a problem of the human system vs. a tool system; we'll never get there if we just concentrate on the tools. The human side has to adapt and change, engage in really concentrated co-evolution.

Q: Is there anything else to add?

A: It's all too easy to classify me as a historical object, but I'm not done yet. Please don't put me on the shelf with the other historical objects.

You can check up on Engelbart's continuing work at www.bootstrap.org. You can also view the 1968 demo at sloan.stanford.edu/MouseSite/1968Demo.html. ▶

Hunt is *Computerworld's* editorial research librarian. You can contact her at laura_hunt@computerworld.com.

Technology Happenings

■ *Computerworld* publishes its first issue.

■ Scientific Data Systems introduces the **SDS 940**. The legend of these supercomputers, called the "computing Corvette" by *Forbes* magazine, outweighs their sales.

■ The White House orders the National Bureau of Standards to settle the debate within federal agencies over the use of **two-digit vs. four-digit dates**. Under pressure from the Pentagon, the bureau keeps the two-digit standard.

■ **Alton Doody** and **William Davidson** publish "Next Revolution in Retailing" in the *Harvard Business Review*. The article outlines the concept of electronic commerce, where consumers use a computer-type console linked to central distribution facilities and transfer funds electronically.

■ **Gene Amdahl** develops Amdahl's law, calculating the advantages of parallel processing.

In Space

■ **January:** Three Apollo astronauts — Virgil I. Grissom, Edward H. White and Roger Chaffee — are killed in a spacecraft during a simulated launch.

■ **May:** The Soviet Union ratifies a treaty with the U.S. and Britain banning nuclear missiles in space.

■ **June:** Space probe Mariner V is launched; it passes Venus.

Born in 1967

■ **Kurt Cobain**, lead singer of the rock group Nirvana.

■ **Deion Sanders**, Dallas Cowboys defensive back

Other Notables

■ **The Beatles'** album *Sgt. Pepper's Lonely Hearts Club Band* is released in the U.S. Kenneth Tynan of the *London Times* calls it "a decisive moment in the history of Western Civilization."

■ The first issue of *Rolling Stone* magazine is published.

■ **The Public Broadcasting Act** of 1967 is passed.

■ **Best Picture:** *In the Heat of the Night*

■ Flashback is produced with the assistance of The Computer Museum History Center in Mountain View, Calif.

The Biafran War erupts in Africa, lasting two years and killing more than 600,000 people.



Thurgood Marshall becomes the first African American to be appointed to the Supreme Court.

Surgeons in Cape Town, South Africa, under the direction of Dr. Christian Barnard, perform the first human heart transplant. The patient, Louis Washkansky, lives for 18 days with the heart.

JANUARY

FEBRUARY

MARCH

APRIL

MAY

JUNE

JULY

AUGUST

SEPTEMBER

OCTOBER

NOVEMBER

DECEMBER

In the first Super Bowl, the Green Bay Packers defeat the Kansas City Chiefs, 35-10.

Following riots in major cities such as Detroit and Newark, N.J., President Johnson appoints the Kerner Commission to assess the causes. Black militant H. Rap Brown calls the violence "as American as cherry pie."

Tens of thousands of protesters converge on the Pentagon to protest U.S. involvement in Vietnam.

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That vision was the genesis of ADPAC, the first mainframe software company in San Francisco. The company released its first product in 1964, a high-level programming language still in use today. That same year, ADPAC became the first company to license a programming language to a corporate customer (the Southern Pacific Railroad).

The technology developed 35 years ago is still at the core of ADPAC

products today. And those products have become even more critical to the continued success of Fortune 1000 companies, governments, and universities worldwide.

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to refer to. Things work, but keeping them working eats up resources in both time and money. And every change to the system, no matter how good for business, is a potential nightmare. Beginning with ADPAC SVCOMMANDS, we make the tools that enable organizations worldwide to deal with mainframe software problems and opportunities — on a timely and cost-effective basis. ADPAC can help you manage, protect and enhance your mainframe assets. Call or visit our web site and find out why one of the first companies in the mainframe software business is still a leader today.

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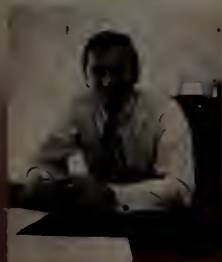
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1967. ADPAC is featured on the cover of the first ever issue of Computerworld. We're the "new language" story in the center.



1963. Peter Harris establishes the first mainframe software company in San Francisco. It's called ADPAC.



1964. ADPAC is the first company to license a software programming language (to the Southern Pacific Railroad). A successor company, Sprint, is still an ADPAC customer today.



1969. ADPAC runs the first full page software ad in The Wall Street Journal. The headline announced: The most important computer advancement in years is not a machine.

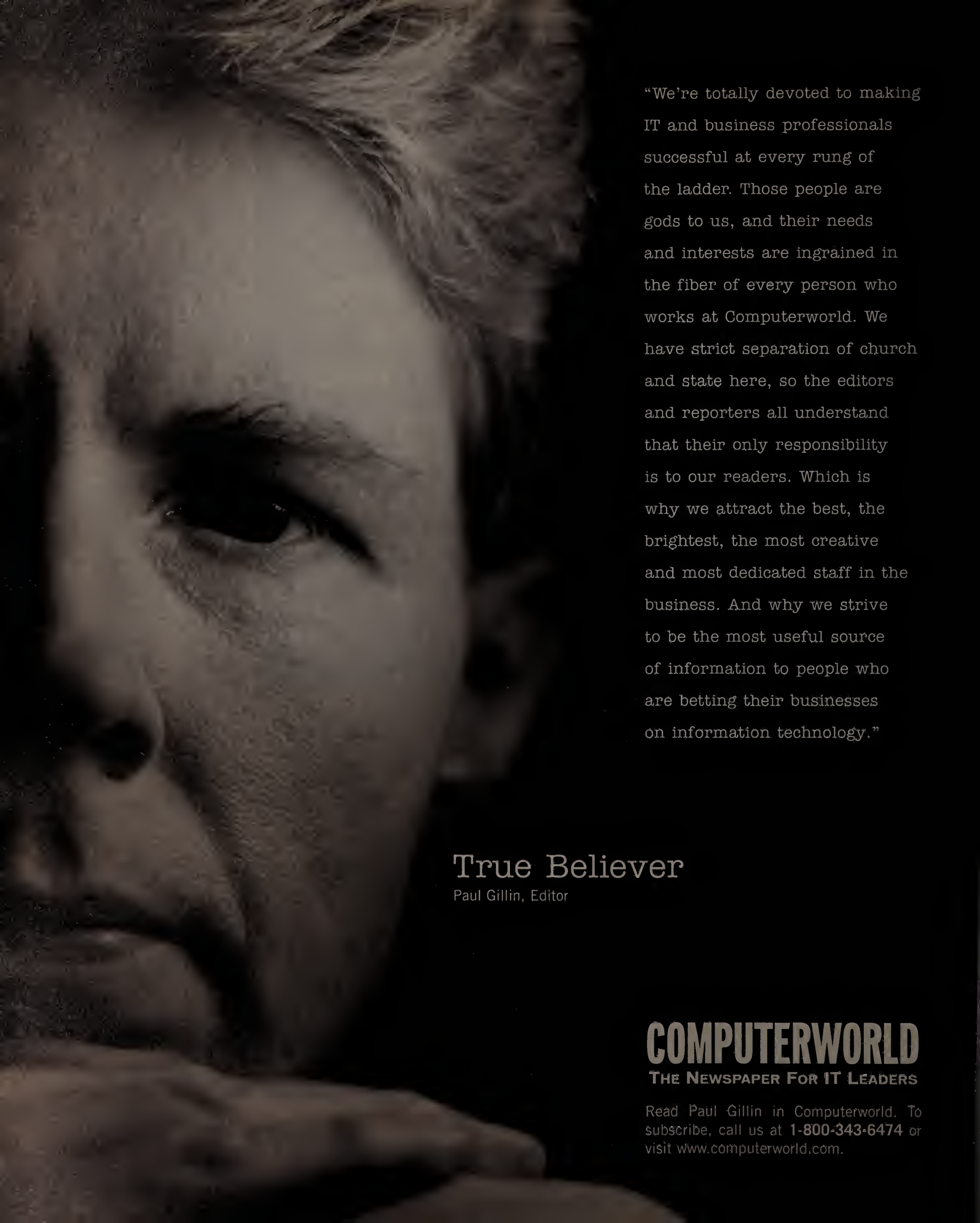


1994. ADPAC introduces the first Y2K solution for mainframe software. (Named "best of breed" by Gartner Group.)

1995. ADPAC sponsors the first Y2K programming conference, with Peter Harris as keynote speaker. It's covered in the mainstream press — the Chicago Trib, Feb. 26, 1996.

1998. ADPAC is the first US software developer to offer a solution to the Euro Currency Conversion.

Y2K



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Bay Area Bounty

Recruiters paint a pretty picture of job opportunities and quality of life in the San Francisco Bay area
By Rochelle Garner

WITHOUT question, the San Francisco Bay area is one of the hottest regions in the U.S. — if not the world — for technology employment. But don't think of the Bay area as just San Francisco.

The region extends north to Marin County, across the East Bay to Oakland and south to the peninsula. And of course, there's Santa Clara County, the geographic name for what we now call Silicon Valley. Technology's mecca is a pretty big place.

What's it like to work in the Bay area? To find out, *Computerworld* talked to three recruiters who specialize in the region.

Thomas McGinley-Swingle

Executive vice president
Chen & McGinley Inc.
San Francisco

Q: Where are the best opportunities

for IT professionals in the Bay area?

A: It's a seller's market right now, and that means demand is all over the place. That said, there are fewer jobs in Marin County than in the town of San Ramon. Plus, a lot of companies are moving back into the city from the suburbs.

Q: What IT positions and skills are the hottest in 1999?

A: Most companies are looking for someone with two to 10 years of experience. The hot skills are Unix, C++, Perl, Java, any Internet or e-commerce technologies, and object-oriented development. The hot platforms are Solaris, HP/UX and Windows NT. And there are still quite a few jobs for mainframe people. We're also seeing growing demand for systems administrators in Windows NT and Unix.

Q: What are the salaries and the work hours like?

A: At the Fortune 500 companies, it's 45 to 50 hours a week — longer when there are upcoming [results]. Salaries are all over the map. What one company may pay for one set of skills, another may be willing to pay \$15,000 more. For example, financial services — like brokerage houses and securities firms — will pay higher salaries than other companies using the same kind of technologies.

Someone skilled in Unix or

C++ might get \$90,000 in the [Silicon] Valley vs. \$80,000 in San Francisco.

Janice Litvin

Director
Micro Search Inc.
Walnut Creek, Calif.

Q: Describe the work culture.

A: As a generality, it's very fast-paced no matter what kind of company you work for. This area is a start-up haven, and it's bred a start-up culture of intense activity that infuses just about every department in just about every company throughout the region.

Q: What IT positions and skills are the hottest in 1999?

A: The hottest skills are Web-related. These include Java, back-end databases like Access, Oracle and Informix, languages like Visual Basic, Perl, CGI Scripting and C++. The focus in this region [is on] all things interactive.

Q: What are the pros and cons of the region?

A: In the pro column: The place is beautiful, with rolling hills, the Pacific and the bay. It's also culturally stimulating, with theater, art, music, dance and people from all over the world. To me, it seems we still have an almost-anything-goes attitude. It seems less judgmental here.

The cons are pretty well-known. It's incredibly expen-

Burn that tie.
... It's still business, but people expect to have fun, too.

DAVE DRUGMAN, PRESIDENT,
BAY CITIES RESEARCH

sive — gasoline prices start at \$1.75 a gallon. A four-bedroom house built after World War II costs about \$400,000 in the less-pricey parts of the region. That same house would cost \$700,000 in Los Altos and \$1 million in Palo Alto.

Traffic is horrible. Despite the wealth here, many of the school systems are pretty bad.

Dave Drugman

President
Bay Cities Research Inc.
Palm Beach, Fla.

(Specializes in recruiting workers to the Bay area)

Q: How would you describe the work culture in the area?

A: Burn that tie. The area places so much emphasis on casual that people wearing a suit are a little suspect. It's also free-wheeling. It's still business, but people expect to have fun, too. It's also Driven with a capital "D" — it's fairly common to see parking lots full at 10 p.m.

Q: What advice can you offer people seeking jobs in the area?

A: [They should] get themselves known by these companies. The bigger companies are going into relationship recruiting, and you have to be seen. Join [Internet] chat rooms and newsgroups, become active in technical associations, drop by the company booth at the wine and trade shows.

Talk to friends to find out what [your] potential boss would be like — and maybe even seek him out. It's not about papering a place with résumés. It's getting to know people, even if there aren't any openings, because when they do need someone, you want to be the person they think of. ▀

Garner is a freelance writer in San Carlos, Calif.

In Demand

Top skills IT that hiring managers in San Francisco and San Jose will be looking for this year:

SKILL	TYPE
ActiveX	Internet
Common Gateway Interface	Internet
HTML	Internet
Web development tools	Internet
Java	Internet
Web server administration	Internet
C	Languages
C++	Languages
Cobol	Languages
Microfocus Cobol	Languages
Visual Basic	Development tools
Visual J++	Development tools
AIX	Operating systems



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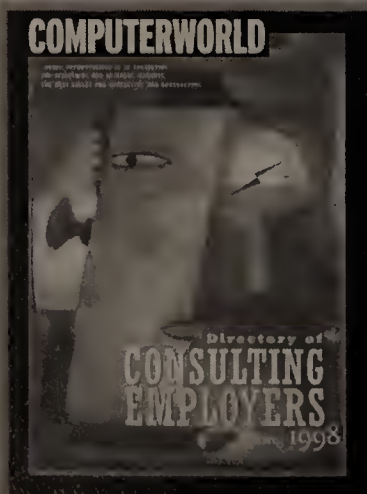
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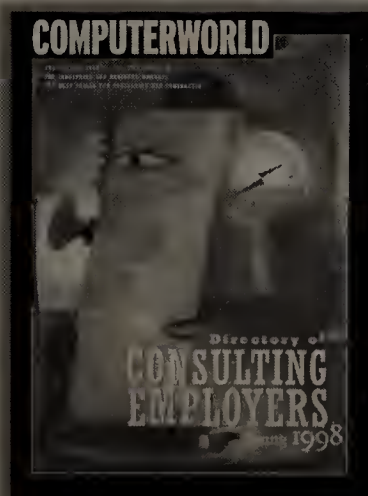
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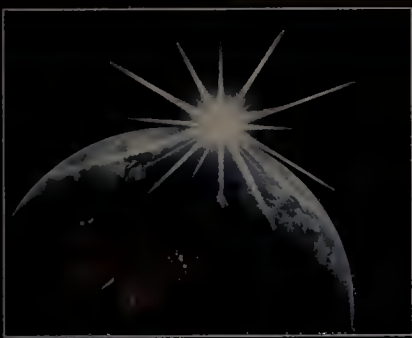
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Software Development Professional (Scientific Programmer) Design, develop, implement and test software for engineering applications such as computer modeling and design of piping systems. Tools: C; C++; FORTRAN. MS in Comp Sci, Electrical Engineering, Math or Physics + 3 months exp. in job offered or as Programmer or Graduate Assistant required. Previous exp. must include: C; C++; FORTRAN 40hrs/wk 9am-5pm. \$51,500/yr. Must have proof of legal authority to work permanently in the U.S. Send two copies of both resume and cover letter to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 7 North, Chicago, IL 60605, Attn: Leila Jackson. Reference #V-IL-20186-J. NO CALLS An Employer Paid Ad.

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Software Engineer: Support the integration of a new operating system to be used with a digital Telecommunication Switch. Architect, design, code and test the interface between the Central Processing Unit of the switch and the Operating System. Determine the software architecture using object-oriented analysis and design techniques. Write software in C/C++. Design and develop a software billing system to be used with the digital telecommunication switch. Test software in a real-time environment. Revise and debug software as needed. Requirements: Bachelor's degree in Computer Science, Computer Engineering or Electrical Engineering and two years of experience in the position offered or two years experience as a Communications Software Designer which must include Operating System integration and use of object-oriented analysis and design techniques. M-F 8:00-5:00, \$58,760.00/year. Apply at the nearest Job Service office, or submit resume with Social Security number to the Job Service, 1105 Briggs Avenue, Durham, NC 27703, J.O. #NC3008392 and DOT code 030.062-010. Ad paid by an equal opportunity employer.

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Systems Analyst. Plan, develop and test computer programs and systems for advanced data communications, database management and technical applications using Powerbuilder and other advanced software tools in a UNIX and Windows environment. Write documentation to describe program development, logic, coding and corrections. Req: Bachelor's degree (or foreign equiv.) in Engineering or Computer Science + 2 yr. work exp. in job development using Powerbuilder software. Applicants must have proof of legal authority to work in the United States. Job/Interview site: Overland Park, Kansas Salary: \$60,000/yr.; 40 hrs./week, plus \$29/hr. overtime. Please apply with a resume in person to a local Kansas Job Service Career Center or send the job resume to: KS Department of Human Resources (#KS9900002) Attention: Jane Burbridge; 401 sw Topeka Blvd; Topeka, Kansas 66603-3812.

Software Engineer (Level I) sought to serve under the supervision of a technical team leader, design, implement, and test financial software libraries and application programs using object-oriented analysis and design (OOA&D) techniques. Use of C++, OOA&D, third-party graphical user interface (GUI) tools and other software development tools. Develop GUI application programs and real-time communications application programs. B.S. or equivalent in Computer Science, Engineering or Math + 1 yrs/exp in job offered or 1 yrs/exp in software development. Experience must include: C++. Education or experience must include OOA&D methodologies. Hours: 40/wk. Salary: Negotiable.

Software Engineer sought to design, implement and test financial software libraries and application programs using object-oriented analysis and design (OOA&D). Use of C++, OOA&D, third-party user interface (GUI) tools and other software development tools. Applications to be developed include GUI application programs and real-time communications applications programs. Will serve as technical team leader of C++ applications developers. Masters in Computer Science required. Education or experience must include C++ and OOA&D. Will accept B.S. + 5 yrs of progressively responsible experience in lieu of Masters degree. Hours: 40/wk. Salary: Negotiable. If interested please send resume to: Mark Wanger, The MacGregor Group, 4 Liberty Square, Boston, MA 02109

SOFTWARE ENGINEER: Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in Visual C++, Image and COBOL. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer, knowledge of Visual C++, Image and COBOL. Salary: \$57,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Mr. Terry Kinney, Armstrong County Job Center, 1270 N. Water Street, PO Box 759, Kittinging, PA 16201, Job No. 6024754.

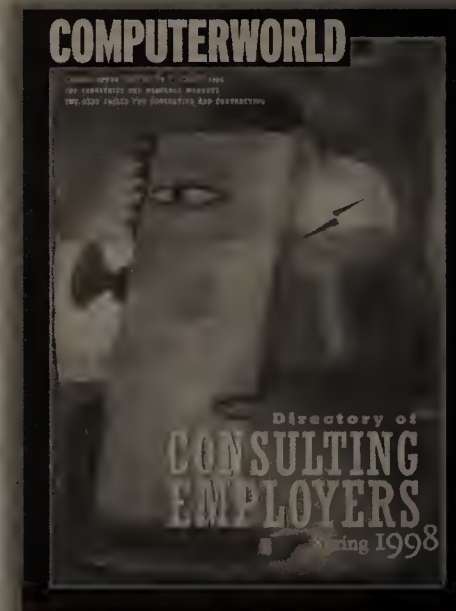
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SOFTWARE ENGINEER: Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in DB2, CICS, VS COBOL II and Expeditor. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer, knowledge of DB2, CICS, VS COBOL II and Expeditor. Salary: \$57,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Mr. Tom Dembosky, Indiana Job Center, 850 N. Fourth Street, Indiana, PA 15701, Job No. 1024873.

INFORMATION ENGINEERS needed to design, develop & implement applications software/systems for the managed health care industry using LINC. MS required in Finance, MIS, Management or MBA plus 1 yr. experience. Must have proof of legal authority to work in the U.S. Salary: \$61,000/year for a 40-hour work week. Send resume to: Illinois Department of Employment Security, 401 South State St. 7 North, Chicago, IL 60605, Attn: Sheila Lindsey, Reference #V-IL 20661-L. AN EMPLOYER PAID AD. NO CALLS - SEND 2 COPIES OF BOTH RESUME & COVER LETTER. Ad paid by An Equal Opportunity Employer.

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Senior Software Engineer needed to design, develop and implement financial and human resources applications in a UNIX/Windows environment using ORACLE as a relational database management system. Re-engineer existing business processes to implement ERP packages such as Oracle Applications in a client server architecture to achieve functionality. Utilize Object Oriented Programming (OOP)/generic algorithms and C++ for process simulation. Utilize GUI tools such as Visual C++ in the design and development process. Utilize proprietary case tools such as ERWIN for data modeling and logical/physical database design. Utilize SQL query optimization and PL/SQL for data loading/aggregation. Must be willing to travel. Min. Req: MS in Computer Science/Instrumentation & Control/Electrical/Electronics Engg. or related field and 3 years of experience. Will accept Bachelors + 5 years of experience in lieu of Masters in a related occupation. Salary: 80,000/yr. 40 hrs/wk. Applicants will be required to submit proof of legal authority to work in the U.S. Send resume to: New Hampshire Department of Employment Security, Job Order #99-159, 32 S. Main Street, Concord, NH 03301.

Software Engineer/Developer to design, analyze, and develop specific application modules required to support major initiatives of Systems and Technology within Distribution and Print Division of a financial services company. Work closely with business analysts in systems role to establish requirements. Responsible for definition, design and programming of business modules that interface with Oracle applications including integration of Oracle's products with third party application products or tools. The development environment includes Oracle Developer and CASE tools, and Oracle database engine. Use U.S. Postal Service certified software for postal cleansing, discounting and metering. Perform PL/SQL programming and database package development. Requires Bachelor Degree in Computer Science, Electrical Engineering or Mathematics and two (2) years experience in job offered or two (2) years experience developing applications in a client/server environment. Candidate must also possess demonstrated expertise developing client/server applications using Oracle Developer 2000 and Designer 2000; demonstrated expertise performing analysis and modeling using rigorous software lifecycle methodology and entity relationship; and demonstrated expertise developing applications which interface with the U.S. Postal Service certified software. Salary: \$45,000/yr; Mon-Fri, 9:00AM-5:00PM. Submit resume to Jane Hosley, 0369665, Dept. for Employment Services, 275 East Main Street 2W, Frankfort, KY 40621. Refer to JO#KY0369665. Applicants must be workers eligible to accept employment in the United States on a full-time basis. EQUAL OPPORTUNITY EMPLOYER.

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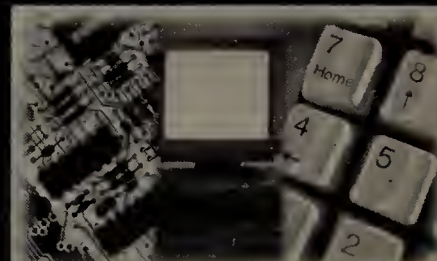
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Senior Software Engineer - Participate in the design of user interfaces for the development of sales engineering automation applications using Visual C++ and VB. To work closely with third party vendors, design and implement complete solutions, work with a variety of APIs, and work well with a team of junior and senior engineers. Perform object-oriented design and analysis; refinement of high level designs; and code and test user interface. Requirements include a Master of Science Degree or equivalent in Computer Science or related field with at least two years of experience in job offered or related field of software development using Visual C++; User Interface Design; and Object-Oriented design tools. Thorough knowledge of Object-Oriented dynamic languages including Smalltalk and Lisp; MFC; ODBC/SQL database connectivity; and Visual Basic/Visual Test. Salary \$68,000/year. 40 hours/wk. Respond with two copies of resume to Case #81303, P.O. Box 8968, Boston, MA 02114.

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SOFTWARE ENGINEER (Location: Blythewood, SC) to analyze, design, develop, test, implement, maintain and support financial application software systems in a client/server, GUI based environment using Visual Basic, SqlWindows, Oracle, SqlServer, Sybase SqlAnywhere, SqlBase, Rational Rose, and Object-Oriented Design and Programming methodologies under Windows 95/NT platforms. Require: B.S. degree in Computer Science, Mathematics, or a closely related field, with two years of experience in the job offered; Extensive travel on assignment to various company and client sites within the U.S. is required. Salary: \$70,000/yr; 8:30 a.m. to 5:30 p.m. M-F. Send resume to: Ms. Regina D. Ratteree, E&T Technical Services, SCESC-SC2000917, Post Office Box 1406, Columbia, SC 29202

Programmer/Analyst: Needed to collect and analyze information for developing and modifying an e-commerce web-site, company website, and business data processing systems; plan, develop and implement computer systems; use VB, VC++, HTML, and a variety of 3rd party tools (for graphic image manipulation); and develop key application programs. Req. MS or equivalent in CS or MIS or other related areas. At least one year exp. In job offered or in Programmer position. Prof. in VB, VC++, HTML, and a variety of 3rd party tools (for graphic image manipulation and developing key application programs). Mon-Fri. 8am-5pm. \$61,400 annual based on exp. Contact Human Resources (Job Code ISPA) 5824-D Peachtree Corners East, Norcross, GA 30092 FAX: 770-582-0410 (PRINCIPALS ONLY)

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Software Engineer needed by Computer Services Co. located in Edison, NJ. Must have Master's degree and 1 yr exp in analysis, dsng & dvlpmt of s/ware for comp n/working & n/work mgmt technology using C/C++, TCP/IP, SNMP and Ethernet Switching in UNIX and Windows envrmt. Respond to: HR Dept, Horizon Companies, 5 Lincoln Hwy, Edison, NJ 08820.

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Systems Engineer wanted by Computer Consulting Co. in Edison, NJ., to work at client locs throughout NJ. Must have Masters or equiv in Comp Sci, Math or Engg & 3 yrs computer experience. (Bachelor's + 5yrs exp acceptable). Respond to: HR Dept, Titan Technologies Group, LLC, 499 Thornall St, Edison, NJ 08837.

Manager, Information Technology needed by Advanced S/ware Research & Dvlpmt Co. in Lexington, MA. Must have Bach in Electrical Engg and 4 yrs exp managing Info Tech Dept. Respond to: HR Dept, Centra Software, Inc, 430 Bedford St, Lexington, MA 02420.

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Oracle Applications Sr. Consultant. Duties: Analyze, design & perform implementation, integration & set-up of Financials & Mfg. software systems using Oracle Applications, Oracle Database, Developer 2000 & other tools. Create reports, interfaces & perform legacy data conversion using Oracle Reports 2.5, PL/SQL, SQL*Plus, SQL*Loader & Unix shell scripts. Analyze & set-up security systems within Oracle Financials & Mfg. Analyze user requirements & configure Oracle Applications software to meet business needs. Conduct tests, user demos & user training to implement applications for clients. Requires: M.S. in Comp. Sci., Eng., or related field and 3 yrs. exp. in the job offered or 3 yrs. exp. as an Analyst/Programmer, Systems Analyst or Software Eng. (Will accept B.S. & 5 yrs. prog. exp. in the computer ind.) Exp., which may have been obtained concurrently, must incl.: 3 yrs. exp. analyzing & designing software systems & 3 yrs. exp. using Oracle, PL/SQL & Developer 2000. EOE. 40 hrs./wk.; 8:00 a.m. to 5:00 p.m. Salary: \$107,000/yr. Send resume (no calls) to: Carrie Shevlin, AnswerThink Consulting Group, 100 West Elm St., Conshohocken, PA 19428. Must have legal auth. to work in U.S.

Applications Consultant. Job Location: Conshohocken, PA. Duties: Design, develop, administration & customization of database, forms, import process, interfaces & reports in Oracle Financials (Accts. Payable, General Ledger, Fixed Assets & Accts. Receivable) using Oracle Financials 10.7/11.0, IBM PC, UNIX, MS Windows, Oracle 7.x, Developer 2000, Discover 2000, SQL Forms 2.3, Oracle Reports 2.0 and SQL Reports. Develop forms & reports with added AOL features and packages and register them as concurrent programs. Resp. for performance tuning, testing reports, writing procedures & functions. Convert character-based Oracle Financials application to GUI based application. Performed tech. support of PowerBuilder for BRAVES applications. Requires: M.S. in Comp. or Info. Sci., Eng. or related field and 2 yrs. exp. in the job offered or 2 yrs. exp. as an Analyst/Programmer, Systems Analyst or Software Engineer. Exp., which may have been obtained concurrently, must incl.: 2 yrs. exp. in the design & development of forms and reports using Oracle financials and 2 yrs. exp. using Oracle Reports and SQL Forms. EOE. 40 hrs./wk.; 8:00a.m. to 5:00p.m. Salary: \$75,000/yr. Send resume (no calls) to: Carrie Shevlin, AnswerThink Consulting Group, 3200 Windy Hill Rd., Suite 800 West Atlanta, GA 30339. Must have legal auth. to work in U.S.

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Oracle Applications Sr. Consultant. Duties: Analyze, design & perform implementation, conversions, system integration & setup of Oracle Financial & Mfg. Applications & Oracle Data Warehouses, using Oracle RDBMS 8/7.x, Oracle Applications, Designer 2000, Developer 2000 and Oracle OFA/OSA. Create interface & conversion scripts for legacy and 3rd party applications using object relational PL/SQL, SQL, UNIX scripting, Visual Basic and Developer 2000. Manage performance, security & disaster recovery on Oracle RDBMS using database maint. tools & applications. Configure multiple applications for use with Oracle 8.7.x databases & Oracle applications. Requires: B.S. in Comp. or Info. Science, Bus. Info. Tech. or related field and 4 yrs. exp. in the job offered or 4 yrs. exp. as a Software Eng., Oracle Developer or Oracle Instructor. Exp., which may have been obtained concurrently, must incl.: 4 yrs. exp. analyzing & designing the set up of Oracle applications & 4 yrs. exp. using Oracle, PL/SQL, Designer 2000, Developer 2000 & UNIX. EOE. 40 hrs./wk.; 8:00a.m. to 5:00p.m. Salary: \$110,000/yr. Send resume (no calls) to: Carrie Shevlin, AnswerThink Consulting Group, 100 West Elm St., Conshohocken, PA 19428. Must have legal auth. to work in U.S.

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Systems Engineer wanted by Computer Consulting Co. in Edison, NJ., to work at client locs throughout NJ. Must have Masters or equiv in Comp Sci, Math or Engg & 3 yrs computer experience. (Bachelor's + 5yrs exp acceptable). Respond to: HR Dept, Titan Technologies Group, LLC, 499 Thornall St, Edison, NJ 08837.

Programmer/Analyst wanted by Comp. Consulting & S/ware Dvlpmt Co. in Newark, NJ. Must have Bach. in Comp Sci or Engg & 1 yr exp dvlpg custom apps to gather & bill data from remote metering systems using C/S & Web technology such as PowerBuilder, JAVA, CORBA, ORACLE 7/8. Respond by resume to: Rashed Khan, Integ Enterprise Consulting, 60 Park Place, Ste 1701, Newark, NJ 07102.

Network Administrator needed by Telecommunication Co. in Long Branch, NJ. Must have Bachelor's in Acctg, Finance or Economics and 3 mos. exp administering NIS+d/bases. Respond to: HR Dept, Golden Bridge Technology, Inc, 185 Route 36 West, Long Branch, NJ 07764.

Network Administrator needed by Telecommunication Co. in Long Branch, NJ. Must have Bachelor's in Acctg, Finance or Economics and 3 mos. exp administering NIS+d/bases. Respond to: HR Dept, Golden Bridge Technology, Inc, 185 Route 36 West, Long Branch, NJ 07764.



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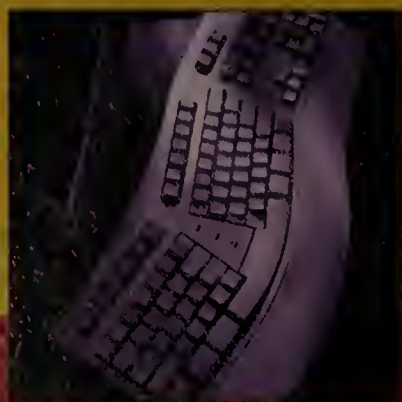
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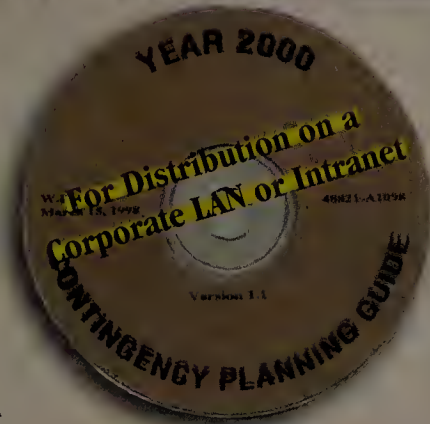
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National Semiconductor	46.9
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Madge Networks	23.9
Tech Data	23.2
Comcast (H)	22.3
Network Computing Dev	22.2
Sterling Commerce Inc.	19.0
AT&T	18.5

DOLLAR

Excite Inc.	20.25
@home Corp.	17.88
Qualcomm (H)	9.63
AT&T	9.50
Comcast (H)	7.03
Uniphase	6.88
IBM (H)	6.44
National Semiconductor	6.06

LOSERS ↓

PERCENT

Amazon.com	-19.2
Newbridge Networks	-17.4
America Online	-16.9
Checkfree	-16.8
Yahoo Inc.	-15.4
Autodesk Inc.	-13.2
Comdisco	-13.0
Safegard Scientifics	-12.9

DOLLAR

Amazon.com	-32.38
Yahoo Inc.	-27.00
America Online	-24.25
EMC	-10.81
Safegard Scientifics	-10.69
Lycos Inc.	-8.81
Lexmark International Group	-8.81
Checkfree	-8.25

TIDE CHANGES
AT EMC, AMAZON

Share prices fall, though
analysts still interested

BY LAURA HUNT

IN SPITE OF THE Dow's rise to more than 11,000 last week, two technology companies didn't share in the bounty. Hopkinton, Mass.-based storage company EMC Corp. (NYSE:EMC) and Seattle-based online bookseller Amazon.com Inc. (Nasdaq:AMZN) both saw declines last week. In fact, EMC's stock has dropped 30% in the past few weeks, and Amazon's shares have fallen 27% during the same period.

Analysts continued to recommend both stocks, though some downgraded their ratings.

Last Tuesday, shares of EMC fell 6.5% after Hewlett-Packard Co. and Hitachi Data Systems Inc. announced joint technology and reseller agreements

covering enterprise storage. HP's move will likely mean it will stop reselling EMC products in favor of Hitachi. PaineWebber, however, called the HP move "neutral" to EMC's continuing success.

Before the drop, EMC shares had risen more than 230% during the past year and recently were up almost 8 points, to 111.75, after the company announced on April 20 that first-quarter revenue rose 36%, to \$1.13 billion, and income climbed 51%, to \$221 million.

Some analysts were unfazed by the events. Gruntal & Co. last week moved its rating for EMC from Buy to Strong Buy, and PaineWebber maintained an Attractive rating.

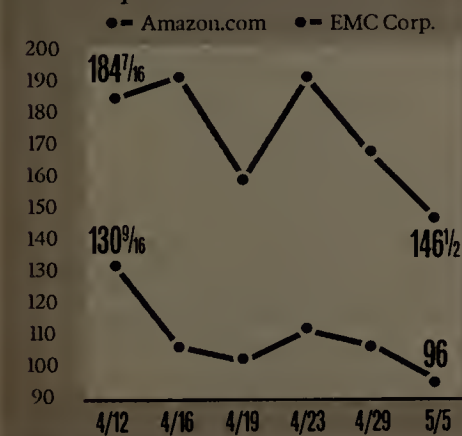
Amazon.com shares fell 13% two weeks ago in reaction to its earnings report and then fell another 5.3% last Tuesday. The company announced \$293.6 million in revenue for the recent quarter but warned that operating losses would continue. BT Alex. Brown Inc. immediately downgraded Amazon from Strong Buy to Buy. And Bear, Stearns & Co. analyst Scott Ehrens issued a report that said, "Good results, but expect lower growth."

Others remained more bullish on the bookseller. Scott Reamer at SG Cowen Securities Corp. in New York, said he wondered what all the fuss was about, given the company's revenue. He also noted the positive prospects of recent acquisitions that should change Amazon's current business model. Those acquisitions include a developer of on-line transaction processor technology as well as a company that provides browser-based information about visited sites [CW, May 3]. "Eyeballs will turn into revenue," Reamer predicted. ▀

INDUSTRY
ALMANAC

Down but not Out

Stock prices for Amazon.com and EMC Corp. have slid in recent weeks



EXCH 52-WEEK RANGE MAY 7 2 PM WK NET CHANGE WK PCT CHANGE

SOFTWARE OFF -0.9%

AOBE	67.25	23.62	Adobe Systems Inc.	67.25	3.75	5.9
AZPN	56.87	6.12	Aspen Technology Inc.	8.81	0.00	0.0
AOSK	49.43	21.62	Autodesk Inc.	25.00	-3.81	-13.2
AVIO	47.75	11.06	Avid Technology	16.00	-0.25	-1.5
BOBJ	42.50	6.12	Business Objects S.A.	24.25	0.44	1.8
CON	39.00	10.62	Cadence Design Systems	12.88	-0.75	-5.5
CBTSY	63.87	6.68	CBT Group Plc.	14.16	-1.22	-7.9
CHKPF	56.00	10.87	Checkpoint Software Tech	36.38	1.06	3.0
CTXS	53.75	23.12	Citrix Systems Inc.	42.13	-1.56	-3.6
COGNF	28.25	14.75	Cognos Inc.	24.00	0.03	0.1
CA	61.93	26.00	Computer Associates Inter'l	42.38	-0.31	-0.7
CPWR	40.00	16.37	Compware Corp.	24.81	-1.06	-4.1
OCTM	54.50	9.37	Documentum	15.13	-1.31	-8.0
EFII	50.25	13.50	Electronics For Imaging (H)	49.19	3.31	7.2
HNCSS	47.12	13.75	Hnc Software	19.88	-1.56	-7.3
IOXC	55.75	12.43	IOX Systems	16.50	-0.13	-0.8
IFMX	14.00	3.50	Informix Software Inc.	6.78	-0.59	-8.1
INTU	110.75	34.18	Intuit	80.75	-3.25	-3.9
JKHY	55.00	26.43	Jack Henry Associates	31.56	-1.56	-4.7
JOEC	49.50	10.87	J.O. Edwards & Co.	13.00	-0.63	-4.6
LGTO	50.75	23.50	Legato Systems Inc.	38.63	-2.13	-5.2
MACR	67.00	12.31	Macromedia Inc.	39.19	-0.44	-1.1
MANU	62.25	5.25	Manugistics Group Inc.	8.00	0.25	3.2
MENT	15.06	5.43	Mentor Graphics	12.88	0.81	6.7
MSFT	95.62	40.93	Microsoft Corp.	79.25	-1.94	-2.4
NETA	67.68	10.06	Network Associates	12.25	-1.00	-7.5
GMH	57.87	30.37	Network General	55.75	0.81	1.5
NOVL	28.12	9.43	Novell Inc.	23.38	1.25	5.6
ORCL	41.18	12.25	Oracle Corp.	24.63	-2.44	-9.0
PMTC	36.31	8.50	Parametric Technology Corp.	12.63	0.13	1.0
PSFT	52.12	11.50	PeopleSoft Inc.	12.81	-0.75	-5.5
PIXR	66.00	27.50	Pixar	47.00	4.25	9.9
PLAT	34.31	9.00	Platinum Technology Inc.	25.75	0.00	0.0
RATL	35.62	10.50	Rational Software Corp.	29.31	-0.19	-0.6
SAP	60.12	23.75	SAP AG	31.75	0.31	1.0
SCUR	29.00	3.75	Secure Computing Corp.	4.13	0.00	0.0
SE	48.75	20.12	Sterling Commerce Inc.	37.63	6.00	19.0
SSW	32.81	18.56	Sterling Software Inc.	19.00	-1.44	-7.0
SORC	27.62	7.50	Structural Dynamics Research	20.50	1.00	5.1
SYBS	11.62	4.50	Sybase Inc.	7.84	0.28	3.7
SYMC	32.62	8.68	Symantec Corp.	19.06	-0.84	-4.2
SNPS	61.25	24.50	Synopsis	49.44	1.50	3.1
SCCT	30.87	7.81	Systems & Computer Technology	13.56	-0.31	-2.3
BAANF	47.50	6.87	The Baan Co. N.V.	9.50	0.06	0.7
VNTV	32.93	5.00	The Vantive Corp.	8.03	0.03	0.4
TSAL	51.00	26.00	Trans. Sys. Arch.	31.25	-1.13	-3.5
VRTS	90.12	23.75	Veritas Software Corp.	70.94	1.44	2.1
WINO	34.43	11.25	Wind River Systems Inc.	14.75	-0.44	-2.9

TELECOMMUNICATIONS CARRIERS UP 2.0%

ATI	102.68	42.25	Airtouch Communications	92.88	-2.25	-2.4
AT	72.43	38.25	Alltel Corp.	63.81	-3.50	-5.2
AIT	69.93	41.50	Ameritech Corp.	66.69	-1.94	-2.8
ANOW	23.00	10.37	Andrew Corp.	14.31	0.31	2.2
T	64.12	32.25	AT&T	60.75	9.50	18.5
BCE	51.06	25.62	BCE Inc.	45.19	-0.38	-0.8
BEL	61.18	40.43	Bell Atlantic	57.75	0.69	1.2
BLS	50.00	31.50	Bell South	45.75	1.44	3.2
CSN	23.43	8.50	Cincinnati Bell Inc.	21.94	-0.75	-3.3
CMCSK	39.62	16.81	Comcast (H)	38.63	7.03	22.3
CQ	41.12	21.75	Comsat Corp.	32.94	0.19	0.6
COX	82.56	41.50	Cox Communications Inc.	81.06	2.81	3.6
GSTRF	35.00	8.31	Globalstar Telecom. Ltd.	20.25	0.25	1.3
GTE	71.81	46.56	GTE Corp.	66.56	-0.06	-0.1
NXLT	42.50	15.37	NexTel Communications	36.06	-4.25	-10.5
SPT	59.12	26.37	Palcomsat	32.88	-1.00	-3.0
QCOM	229.50	37.75	Qualcomm (H)	215.25	9.63	4.7
SBC	59.93	35.00	SBC Communications	53.94	-2.25	-4.0
FOH	114.62	54.43	Sprint Corp.	109.00	5.31	5.1
TOS	65.56	30.62	Telephone and Data Systems (H)	65.56	5.56	9.3
USW	66.00	46.81	US West	54.88	2.63	5.0
VIA	48.75	24.62	Viacom	41.56	0.31	0.8
WCII	54.62	10.25	Winstar Communications Inc.	46.94	-1.31	-2.7
WCOM	94.87	39.00	MCI Worldcom Inc.	86.44	3.94	4.8

SERVICES OFF 1.1%

ACXM	31.25	16.50	Axiom Corp.	24.88	-0.75	-2.9
ACS	51.75	22.37	Affiliated Computer Servs	39.81	1.19	3.1
AMSY	40.25	19.25	American Mgt. Systems	30.75	-3.38	-9.9
AUO	46.87	30.81	Automatic Data Processing	44.56	0.00	0.0
BSYS	59.37	35.25	Bsys Group Inc.	49.75	-2.25	-4.3
CATP	58.37	10.62	Cambridge Technology Ptns	13.81	-0.81	-5.6
CEN	40.50	24.00	Ceridian	35.13	-0.25	-0.7
C8R	40.87	13.31	Ciber Inc.	20.50	1.50	7.9
COO	30.87	10.75	Comdisco	23.50	-3.50	-13.0
CHRX	44.75	9.25	Computer Horizons Corp	14.25	0.06	0.4
CSC	74.87	46.25	Computer Sciences	59.00	-0.63	-1.0
OST	70.56	34.00	Ost Systems Inc.	56.94	-2.00	-3.4
EOS	56.12	30.43	Electronic Data Systems	52.56	-0.50	-0.9
FOC	46.25	19.68	First Data Group	43.63	0.06	0.1
FISV	40.75	24.62	Fiserv (H)	39.31	-0.19	-0.5
IT	35.62	17.31	Garner Group	20.00	0.81	4.2
KEA	60.93	17.25	Keane	24.94	-0.44	-1.7
NOC	55.25	26.18	National Data	41.88	-3.56	-7.8
PAYX	55.06	33.12	Paychex Inc.	49.25	-1.50	-3.0
REGI	23.06	4.00	Renaissance Worldwide	7.25	0.63	9.4
REY	23.50	12.62	Reynolds & Reynolds (H)	22.56	-0.44	-1.9
SFE	120.00	17.12	Safegard Scientifics	72.13	10.69	12.9
SAPE	82.87	24.25	Sapient Corp	64.63	3.00	4.9
SMS	86.50	40.06	Shared Medical Systems	58.25	2.88	5.2
SOS	41.93	21.68	Sungard Data Systems	29.94	-2.94	-8.9
SYNT	32.62	8.68	Syntel Inc.	19.06	-0.84	-4.2
TECO	53.12	14.50	Tech Data	28.25	5.31	23.2
TSS	26.25	14.43	Total System Services Inc	18.31	-0.94	-4.9
TSAL	51.00	26.00	Transaction Sys. Architects	31.25	-1.13	-3.5

NETWORK UP 3.7%

COMS	51.12	20.00	3Com Corp	26.00	-0.13	-0.5
AQCT	52.25	15.75	AQC Telecommunications Inc.	43.94	-3.38	-7.1
ANTC	29.68	11.50	Antec	28.94	2.06	7.7
ASNO	102.56	32.62	Ascend Communications Inc	92.00	-3.00	-3.2
BNYN	19.37	2.12	Banyan Systems Inc	12.25	-0.13	-1.0
CS	15.31	6.62	Cabletron Systems	10.81	1.44	15.3
CNEBF	20.00	5.75	Call-Net Enterprises	7.38	0.41	5.8
CSCL	120.00	41.12	Cisco Systems Inc.	108.31	3.69	3.3
ECILF	45.00	19.75	ECL Telecom	35.69	-1.69	-4.5
FORE	34.62	9.25	Fore Systems Inc	33.81	0.19	0.6
HRS	52.43	27.31	Harris Corp	36.56	2.38	6.9
GMH	57.87	30.37	Hughes Electronics/GM	55.75	0.81	1.5
ERICY	34.00	15.00	LM Ericsson	26.81	0.19	0.7
LU	67.00	26.68	Lucent Technologies	57.19	-1.88	-3.2
MAQGF	7.43	1.75	Madge Networks	3.56	0.69	23.9
NCOI	9.25	4.37	Network Computing Dev	6.19	1.13	22.2
NWK	20.00	7.31	Network Equipment Tech	8.38	0.56	7.2
NN	39.87	15.43	Newbridge Networks	30.19	6.38	17.4
NOK	85.68	29.50	Nokia Corp	75.00	1.25	1.6

EXCH 52-WEEK RANGE MAY 7 2 PM WK NET CHANGE WK PCT CHANGE

NT	78.25	26.81	Northern Telecom Ltd.	67.25	-1.00	-1.5
PAIR	20.12	6.00	Pairgain Technologies Inc.	14.69	1.94	15.2
PCTL	11.93	4.31	Picturetel	8.94	0.88	10.9
SFA	35.00	11.75	Scientific Atlanta	32.75	1.38	4.4
TLAB	120.25	31.37	Tellabs Inc	108.50	-0.13	-0.1
USW	66.00	46.81	US West	54.88	2.63	5.0
YRLK	9.25	2.12	Verlink	3.13	0.25	8.7
WSTL	12.12	2.75	Westell Technology Inc.	6.91	0.53	8.3

SEMICONDUCTORS, CHIPS & EQUIPMENT UP 4.5%

AOPT	26.75	7.87	Adaptec	24.06	0.19	0.8
AMO	33.00	9.31	Advanced Micro Devices	17.75	1.25	7.6
ALTR	82.31	28.25	Altera	75.31	2.50	3.4
AOI	38.37	12.00	Analog Devices	37.00	1.00	2.8
AMAT	71.62	21.56	Applied Materials	56.69	3.25	6.1
ASML	50.37	12.93	ASM Lithography Holding	40.25	1.25	3.2
HRS	52.43	27.31	Harris Corp.	36.56	2.38	6.9
INTC	71.87	32.87	Intel Corp	60.81	0.13	0.2
KLAC	65.00	20.75	Kla Instruments	52.38	2.13	4.2
LLTC	64.12	19.56	Linear Technology	55.00	-1.94	-3.4
LSI	38.31	10.50	LSI Logic	36.75	2.44	7.1
MXIM	65.12	22.31	Maxim Integrated Products	55.66	-1.47	-2.6
MU	80.56	20.06	Micron Technology	38.50	1.13	3.0
MOT	86.00	38.37	Motorola	77.13	0.56	-0.7
NSM	21.93	7.43	National Semiconductor	19.00	6.06	46.9
STM	121.68	35.87	SGS-Thomson Microelectronics	105.63	2.13	2.1
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SAP AHEAD OF USERS IN E-COMMERCE PUSH

Getting back office in place is a prerequisite

BY CRAIG STEDMAN
NICE, FRANCE

FOR SOME users who want to follow SAP AG down the e-commerce path it laid out last week, there's a not-so-small issue they need to take care of first: finishing their SAP R/3 installations.

And that won't happen at Internet speed, said several users at SAP's Sapphire '99 conference here, after the German vendor announced a promised expansion of its Web development plans [CW, May 3].

For example, Amsterdam-based Philips Consumer Electronics wants to start doing business online next year, CIO Henk Sangen said during a

speech at Sapphire. "But I'm still not ready with my transactional backbone," he added.

A corporate R/3 system Philips started installing three years ago for more than 10,000 users will eventually be that backbone. But the company is only halfway through the project and will probably still run 20% of its business on something other than R/3 two years from now, Sangen said.

The situation is similar at Wella AG, a maker of cosmetics and hair care products in Darmstadt, Germany.

Wella plans to start doing business online "in a very limited way" later this year, said Wolfgang Hildebrandt, the company's European manager

of information technology. But that will involve only direct sales to hair salons in countries that have gone live with R/3.

The company doesn't want to set up e-commerce applications to work with homegrown systems that are scheduled to be replaced by R/3, Hildebrandt said. Fully installing SAP software in Europe could take another two years, he added.

The Internet technology in the works at SAP includes a browser-based R/3 user interface, new online sales applications aimed at users of back-office applications and a My-Yahoo-like Internet portal that SAP will use to host an e-commerce marketplace connecting buyers and sellers.

Rival vendors are also trying to latch on to e-commerce with mixes of online business applications and their own Web marketplaces. For example, Pleasanton, Calif.-based PeopleSoft Inc. last week confirmed that an Internet portal it detailed last fall will be formally launched in August.

SAP's *mySAP.com* site is scheduled to open for business in the second half of the year.

But in most cases, SAP and other vendors "are light-years ahead of their customers" on e-commerce, said Joshua Greenbaum, an analyst at Enterprise Applications Consulting. ▀

Coming Soon

Products announced by SAP last week include:

B2C Selling	Companion package for selling to consumers, available now.
Business Information Warehouse 1.2	Data warehousing upgrade with expanded set of preloaded analysis routines, available now.
Knowledge Warehouse 4.0	Upgraded R/3 training and documentation software, due out in Q3.
Advanced Planner and Optimizer 2.0	Second release of supply-chain planning tool, due out in Q4.
B2B Selling	Software for managing online sales to other businesses, due out in Q4.

Continued from page 1

H-1B Visas

consulate last year to detect H-1B visa fraud. The consulate processed 20,000 H-1B applications last year, mostly for computer programmers.

H-1B visas allow highly skilled professionals to work in the U.S. for up to six years. By law, H-1B applicants must have a bachelor's or higher degree in a specialized field; upon arriving in the U.S., the individual also must work in the specific job and for the specific

company named on the application. The most common types of fraud involve companies petitioning for H-1B visas without having a specific job for a worker and falsifying educational data, Yates said.

A State Department official said the problem will continue as long as legislation governing the visas is vague. "We will continue to receive petitions for applicants who do not have the highly desirable skills or managerial experience that Congress intended to bring into this country," Jill Esposito, directorate for visa services, told the Subcommittee on Im-

migration and Claims.

"If we want to make H-1B a source for truly high-tech workers, we should avoid having so many of [them] sopped up by persons with a college degree and a bit of artful packaging," said consultant John Ratigan at the law firm Paul, Weiss, Rifkind, Wharton & Garrison in Washington.

In addition, "policy makers need to address such questions as what degree should we allow H-1B visas to be used for entry-level positions and [whether] we want to put any limits on their use by contractors," Ratigan said. ▀

Continued from page 1

CEO Vows Fix

But in interviews at Sapphire '99, Plattner and other SAP executives said the demand overwhelmed the AFS developers. The software also wasn't well-integrated with other parts of R/3 or key third-party applications such as warehouse management systems, they added.

The steps being taken by SAP sound like "a major, positive change," said Leroy Allen, vice president of re-engineering at VF Corp. in Greensboro, N.C. Allen and two co-workers arrived here just before Sapphire started to meet with SAP executives about their plans for straightening out AFS.

'Once and For All'

"I think they finally do realize they've got a product that can be successful if they fix the problems, or [else] they've got a product that's going to be a failure," he said. "We left there feeling like they were finally going to deal with this once and for all."

SAP promised to deliver this month the bug fixes that VF, a maker of jeans and other clothing, needs so it can start stress-testing a full R/3 and AFS system on schedule in late June.

Because of the bugs, applications such as production plan-

JUST THE FACTS

SWAT Tactics

What AFS is: A set of R/3 add-on applications for apparel and footwear manufacturers that need to track each product across categories such as size, color and style.

The problems: AFS isn't fully stable, features such as interfaces to warehouse management systems aren't available, and the AFS development team has been overwhelmed by requests for help from users.

What SAP is doing: AFS is being combined into its core retail development unit, and a SWAT team of developers has been assigned to work with early users.

ning and materials management aren't working properly, Allen said. An SAP development manager is due to arrive in Greensboro this week to work directly with VF as part of the SWAT team, he added.

Problems with some early AFS installations came to light late last year [CW, Dec. 14].

John Bermudez, an analyst at AMR Research Inc. in Boston, said AFS was launched "as sort of a partially conceived add-on" to R/3. But if SAP can make the software work properly, he said, it faces little competition from its application rivals.

AFS will become a core part of SAP's retail-oriented product line, said Peter Zencke, an executive board member. ▀

MOREONLINE

For SAP resources, visit our Web site.
www.computerworld.com/more

SAP Retail Users Want More, Too

SAP is more established in retail than in the apparel industry: About 40 companies have gone live with its merchandising applications. But several customers said SAP Retail still needs to be beefed up before they can fully use the software.

For example, the German grocery division of Tengelmann Group has set up a test installation of SAP Retail and plans to use the applications to manage its entire 5,000-store chain.

But first, SAP has to make it possible to spread the software across separate R/3 systems in business units and then synchronize the data at the corporate level, said Peter Wickertsheim, CIO at the grocery division in Mulheim, Germany.

Getting to that point "surely will

take two to three years," Wickertsheim said. "This is heavy stuff."

Coop Schweiz, a retailer in Basel, Switzerland, is also waiting for more functionality before moving ahead with a rollout of SAP Retail for managing product mixes in its stores.

The company is looking for better support for tasks such as planning promotions and laying out stores, said Marlies Hartmann, a project leader at Coop Schweiz.

SAP executives said a development team focused on distributed retail systems held its first meeting last week. They also outlined improvements in areas such as seasonal planning and product assortment management that will start appearing this summer.

- Craig Stedman



FRANK HAYES/FRANKLY SPEAKING

Break it up, Bill

A LONG TIME AGO in an Emerald City far, far away, there was a high-tech empire that ruled with an iron hand. The Emperor Bill had built it, piece by piece, into the mightiest force its market had ever seen. But the empire faced a powerful attack from the federal government. The legal battle was already lost. The only real question was whether the empire would fight to the bitter end — or embrace the inevitable and begin turning it to the empire's own advantage.

Wonder how the story ends? We already know. Bill Boeing decided to break up his United Aircraft and Transport Corp. Out of that 1934 split came today's Boeing Co., United Technologies Corp. and United Air Lines Inc. Together, those three Fortune 100 companies have more in revenue than IBM — or any other computer company.

Success beats the heck out of a losing battle to the death, eh?

Now it's time for you, Bill Gates, to follow the lead of Bill Boeing and break up another Seattle-area high-tech empire. Don't wait for the Justice Department or the courts to act. You should break Microsoft into three parts — and do it right now.

It would be good for Microsoft stockholders: They'll have three rockets to ride instead of just one. It would be good for your customers, who wouldn't have to worry about the government harassing a major supplier for the next couple of decades. And it would be good for Microsoft itself, opening up a whole range of business opportunities currently stifled by the Windows-oriented political correctness in the company.

Best of all, it would let you score a decisive win against your Justice Department inquisitors.

They claim you're using the synergy between Microsoft's products illegally. But if Microsoft breaks itself up, there's no potentially illegal synergy. The Justice Department's argument becomes moot.

As usual, you can win — and win big — by redefining the game. Wait until the Justice Department breaks Microsoft up and you'll have them looking over your shoulder forever, telling you what you can and can't do. Break Microsoft up yourself and you can position each of the Baby Bills exactly as you want.

You can have an operating system company — call it Windows Inc. — that still has a monopoly in the PC operating system business, but without any accusations that you're somehow tying in or bundling other products.

You can have an Internet company — call it Internet Explorer Corp. — with browsers and Web servers and Expedia and MSNBC. Being a more-or-less pure Internet play, it would get a Web company's buzz and market valuation. And who's to say IECorp. can't sell Internet technology to, say, Windows Inc.?

Finally, you can have an application software company — call it Microsoft, just for old times' sake. It'll sell Word and Excel and, yes, good old Basic (what would Microsoft be without Basic?). No one can accuse the new Microsoft's programmers of using inside knowledge about Windows they don't have. Without the old Microsoft's Windows-centrism, Microsoft applications can corner the market everywhere — not just on Windows.

And the new Microsoft, IECorp. and Windows Inc. could tell the Justice Department to go whistle.

No one will care that Windows 2000, Office 2000 and Internet Explorer 2000 come from three different companies. You've already gained all the brand recognition and customer leverage you can from having one big company.

So break it up, Bill. Change

the game, and take it off the Justice Department's court. In the end, the pieces of Microsoft will be bigger and more powerful than the old company ever was. That's how your empire can really strike back. ▀

Hayes, Computerworld's staff columnist, has covered IT for 20 years. His e-mail address is frank_hayes@computerworld.com.

Don't wait for
the Justice
Department
or the courts.



SHARK TANK

HEADHUNTERS DO THE

DARNEDEST THINGS: A guy calls a software developer that's also a Microsoft partner. Calls himself Michael Kubida and says he's part of Microsoft's Developer Network. He demands the names of *all the company's employees*. The company (which requests anonymity in the Tank), checks around. Can't find any Michael Kubida at Microsoft. (Neither can Microsoft. Neither can Sharky.) "We suspect it's a recruiter trying to bamboozle us," says a source at the developer.

SEARS' NEW CIO, Jerry Miller, is pushing what he calls "three up, three down." Every week, Miller's direct reports must present three bits of information they communicated to their people (that's the three down) and — here's the radical part — three items that bubbled up from the rank and file (three up). That's too good an idea, Jerry — it'll never work.

WITH AN ADMIRABLY

STRAIGHT FACE, Virgin Atlantic says Y2K concerns have nothing — nothing at all, mind you — to do with the fact that its planes won't be flying New Year's Eve. "Our passengers were telling us they would rather

be with their loved ones than in a 747 over the Atlantic [that night]. Our employees agreed," said Virgin's Paul Moore. That's his story, and he's stickin' to it.

RAISE YOUR HAND if you don't give a rat's patoot about *Star Wars*. Me neither. But we're a minority: The Tank keeps hearing dire warnings of a big Silicon Valley sick-out on May 19, when the movie opens. A human resources outfit has gone so far as to advise workers who plan to skip work for the flick to "use pre-approved vacation time." Call the Shark old-fashioned, but around here only opening day of the baseball season merits that kind of hooky.

UGLY AMERICAN AWARD

NOMINEE: "Outside the U.S., there ain't no cable. There's barely telephone." That was Edward Horowitz, e-commerce chief at Citigroup. This does *not* strike the Tank as the way to build a global financial colossus.

In a recent survey, 20% of respondents acknowledged using e-mail to avoid speaking with people. What's the world coming to? To feed Sharky, call... um, come to think of it, send an e-mail to sharky@computerworld.com.

The 5th Wave

WHEN POWER USERS WANT PERFORMANCE AND FUN, THEY TURN TO THE...

HiJinx Interactive Workstation

17" FunHouse monitor distorts and bends your files into interesting and engaging documents

64GB hard disk has Squirting Flower processor



AirJet Keyboard sends hats, wigs & toupees flying around the room

JoyBuzzer trackball keeps users howling



© RICH TARRANT

**THIS IS
STORAGE**

Loves bossa nova. | Aficionado browses music store on the Web.
Instantly locates and samples obscure CD. Orders 'Bossa Nova A-Go-Go.'

IBM

Why rethink storage? | e-business means data is being looked at, listened to and interacted with in ways that can overwhelm your storage system. Keeping a complex mix of files, from small to colossal, accessible to everyone, night and day, can be the difference between closing a sale and a closed door.

How IBM storage can help you. | Versatile Storage Server® delivers cross-platform access, including UNIX and Windows NT. And Virtual Tape Server offers intelligent disk-caching to maximize the use of tape capacity — making your system more economical. Disk, tape or optical, serial or fibre-based connectivity, nobody offers a wider range of storage tools, software and services.

Make the most of your data: www.ibm.com/storage/tools

 e-business tools

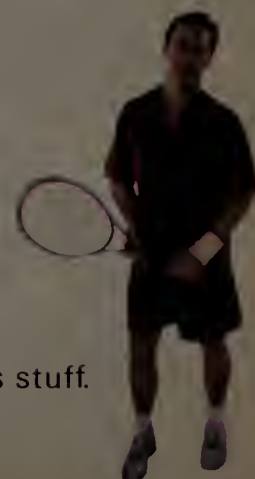
You'll never guess what we were doing when we came up with the idea for our new server.

Actually, we were thinking of ways to help our clients reduce their total cost of operations. And it occurred to us that consolidating complicated IT environments would be a good place to start. Which, naturally, led to the development of the new Unisys Aquanta™ ES 5000 line of midrange servers based on the equally new Intel® Pentium® III Xeon™ processor. These robust servers help you handle workloads on multiple partitions, while maintaining single-image operations and management. And they improve availability by providing a fully recoverable environment for your applications, databases and transactions. For more points on our new servers, check out our Web site. Meanwhile, we'll be working on our, well, you know.

www.marketplace.unisys.com/ent/



Aquanta
ES 5000



UNISYS

We eat, sleep and drink this stuff.

AND THE WINNERS WERE...

LAST YEAR the Chairmen's Committee—leading technologists, prominent educators, and internationally-known leaders—painstakingly trimmed more than 400 case studies to 50 finalists in 10 categories. The award recipients were announced at a black-tie gala in Washington, DC.

1998 AWARD RECIPIENTS

BUSINESS & RELATED SERVICES

AWARD RECIPIENT: Amazon.com, Inc.
NOMINATED BY: Booz*Allen & Hamilton Inc. and Netscape Communications Corporation
PROJECT: A unique *online book store* gives people around the world instant access to 2.5 million titles.

EDUCATION & ACADEMIA

AWARD RECIPIENT: JASON Foundation for Education
NOMINATED BY: Sprint
PROJECT: *JASON Project* allows students to control the equipment utilized for scientific investigators from their classrooms.

ENVIRONMENT, ENERGY & AGRICULTURE

AWARD RECIPIENT: U.S. Environmental Protection Agency
NOMINATED BY: Oracle Corporation
PROJECT: *Envirofacts Warehouse on the Internet* provides environmental information on more than a million sites handling or discharging potentially harmful substances.

FINANCE, INSURANCE & REAL ESTATE

AWARD RECIPIENT: Fannie Mae and Finet Holdings Corporation
NOMINATED BY: Sun Microsystems, Inc./ Sybase, Inc.
PROJECT: *Internet-Enabled Homeownership* lets consumers use the Internet to gather home buying information, complete a mortgage application and receive on-line loan approval from participating lenders.

GOVERNMENT & NON-PROFIT ORGANIZATIONS

AWARD RECIPIENT: Focus: HOPE
NOMINATED BY: EDS
PROJECT: *Center for Advanced Technologies* prepares minority men and women to be the next generation of manufacturing engineers.

MANUFACTURING

AWARD RECIPIENT: Genentech, Inc.
NOMINATED BY: Microsoft Corporation
PROJECT: *Final Purification Expansion* expedites critical steps in the manufacturing of new drugs.

MEDIA, ARTS & ENTERTAINMENT

AWARD RECIPIENT: P.S. 41 (Brooklyn, NY)
NOMINATED BY: Matsushita Electric Corporation of America/Panasonic Communications & Systems Company
PROJECT: *Kid Witness News*, with complete video production studios in inner city elementary and junior high schools, teach teamwork, leadership, and communications skills, and raises self-esteem and academic performance.

MEDICINE

AWARD RECIPIENT: Maimonides Medical Center
NOMINATED BY: Unisys Corporation
PROJECT: *Integrated Health Care Delivery Solution* empowers all health care service team members with the information they need, when and where they need it.

SCIENCE

AWARD RECIPIENT: University of California, Berkeley's Search for Extraterrestrial Intelligence (SETI) Program
NOMINATED BY: Toshiba America Information Systems, Inc.
PROJECT: *Search for Extraterrestrial Radio Emissions from Nearby Developed Intelligent Populations (SERENDIP) Project* uses specialized circuitry, matching the processing speeds of 200 supercomputers, to search 168 million channels of astronomical data simultaneously in the search for extraterrestrial life.

TRANSPORTATION

AWARD RECIPIENT: SAIC—Science Applications International Corporation
NOMINATED BY: Price Waterhouse
PROJECT: *The Vehicle and Cargo Inspection System (VACIS)* processes gamma ray images, allowing freight train cars traveling at full speed to be inspected for drugs or stolen automobiles.

1998 LEADERSHIP AWARD HONOREES

The Computerworld Smithsonian Program honors five leaders each year whose sustained breadth of vision and pivotal contributions to the industry make them role models for the continuing information revolution. These are men and women whose ideas and accomplishments have profoundly improved the application of information technology to society.

Price Waterhouse Award for Lifetime Achievement

JAY W. FORRESTER

Germenhausen Professor Emeritus of Management Senior Lecturer, Sloan School of Management, Massachusetts Institute of Technology, for pioneering the field of system dynamics, enabling major advances in the understating of behavior systems.

The MCI Award for Innovation

ROBERT METCALFE

Vice President of Technology, International Data Group, founder of 3Com, for the invention of Ethernet and development of local area networking.

Ernst & Young Award for Global Integration

SCOTT MCNEALY

Chairman and CEO, Sun Microsystems, for leadership in establishing industry computing standards.

Silicon Graphics Award for Breakthrough Science

JOHN POPL

Board of Trustees Professor of Chemistry Northwestern University, for developing methods and tools used in quantum chemistry.

Toshiba America Information Systems Award for Education

AL GORE

Vice President of the United States, for leadership in the establishment of a National Information Infrastructure.

THE 11TH ANNUAL
**COMPUTERWORLD
SMITHSONIAN**
AWARDS

<http://innovate.si.edu>

COLLECTING AND RECORDING THE HISTORY OF IT LEADERS

UNDER THE LEADERSHIP of Patrick J. McGovern, Chairman of International Data Group and founder of *Computerworld*, members of the Computerworld Smithsonian Awards Chairmen's Committee nominate IT innovators who, in their personal opinion, merit recognition for the quality and impact of their work.

The involvement and commitment of the individual members of the Chairmen's Committee has been essential to the growth of the Computerworld Smithsonian Innovation Collection. The quality of the applications selected for inclusion in the Collection is testimony to the seriousness with which the Chairmen carry out this important research function.

3Com Corporation
Eric A. Benhamou

Acer America Corporation
Max Wu

Adobe Systems Incorporated
John Warnock

Advanced Micro Devices
W. J. Sanders III

Amdahl Corporation
Dave Wright

America Online Incorporated
Stephen M. Case

Ameritech
Richard Notebaert

Andersen Consulting
George T. Shaheen

Apple Computer, Inc.
Steve Jobs

Ascend Communications
Mory Ejabat

AT&T
C. Michael Armstrong

Bell Atlantic
Ivan Seidenburg

BellSouth
F. Duane Ackerman

BMC Software, Inc.
Max Watson, Jr.

Booz•Allen & Hamilton, Inc.
William Staisor

Bull HN Information Systems, Inc.
George McNeil

Candle Corporation
Robert LaBant

Cincom Systems, Inc.
Thomas Nies

Cisco Systems
John Chambers

Comdisco, Inc.
John Slevin

Compaq Computer Corporation
Eckhard Pfeiffer

Computer Associates International, Inc.
Charles Wang

Computer Motion, Inc.
Robert W. Duggan

Compuware Corporation
Peter Karmanos, Jr.

Data General Corporation
Ronald Skates

Dell Computer Corporation
Michael Dell

Deloitte Consulting
Stephen Sprinkle

Diebold, Incorporated
Robert Mahoney

Eastman Kodak Company
George Fisher

EDS
Dick Brown

EMC Corporation
Richard J. Egan

Epson America, Inc.
Norio Niwa

Ernst & Young LLP
Kenneth Katzif

Evans & Sutherland Computer Corporation
James R. Oyler

Excalibur Technologies
Patrick Condo

FileNet Corporation
Ted Smith

Geac Smartstream
Bill Nelson

GTE Internetworking
Paul Gudonis

Hewlett-Packard
Lewis E. Platt

Hitachi Data Systems
Steven West

Hughes Network Systems
Jack A. Shaw

IBM Corporation
Louis Gerstner

Information Builders, Inc.
Gerald D. Cohen

Informix Software
Robert Finocchio, Jr.

Intel Corporation
Craig R. Barrett

JD Edwards
C. Edward McVane

KPMG Peat Marwick, LLP
Roger Cerritelli

Lernout & Hauspie
Bob Kutnick

Lexmark International, Inc.
Paul Kurlander

Lockheed Martin IMS
John Brophy

Lotus Development Corporation
Jeff Papows

Lucent Technologies
Richard McGinn

Lycos, Inc.
Robert Davis

Madge Europe
Robert Madge

Matsushita Electric Corporation of America
Paul F. Liao

MCI WorldCom
Bernie Ebbers

Microsoft Corporation
William H. Gates

Morgan Stanley Dean Witter
Merritt Lutz

Motorola, Inc.
Gary L. Tocker

NCR Corporation
Lars Nyberg

NEC Technologies, Inc.
Kenjiro Nitta

Netscape Communications
James Barksdale

Nortel Networks
David House

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Oracle Corporation
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SCO
Alok Mohan

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Casey Powell

Shared Medical Systems Corporation
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Siemens Business Communications
George Nolen

Silicon Graphics, Inc.
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Software AG Americas, Inc.
Daniel F. Gillis

Software Engineering of America, Inc.
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Southwestern Bell
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Sprint
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Sterling Software, Inc.
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Storage Technology Corporation
David Weiss

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